McGraw-Hill International

B 653798 222138

Management Digest®

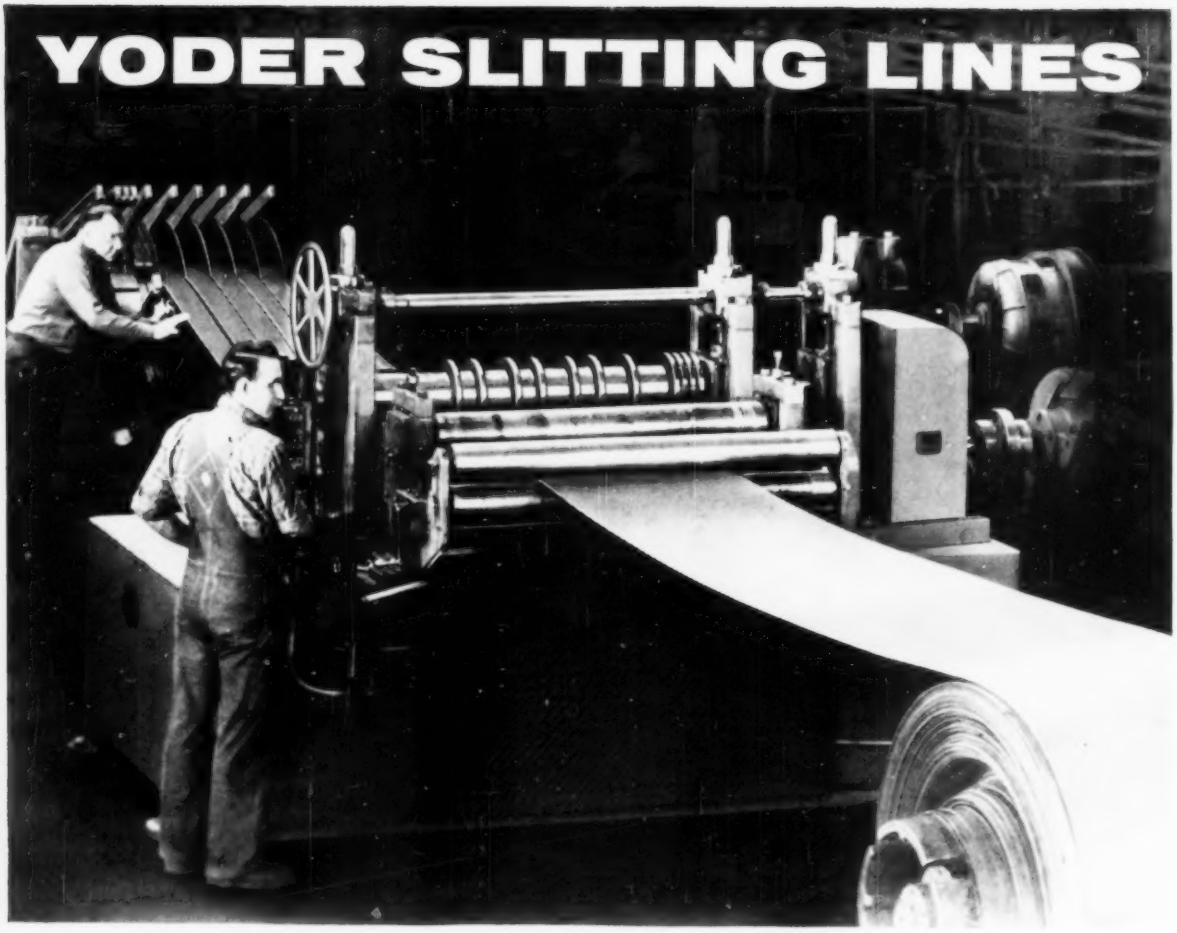
MAY 1957 LATIN AMERICAN EDITION

Giscard d'Estaing of the ICC: Businessmen of the world, unite!—p11

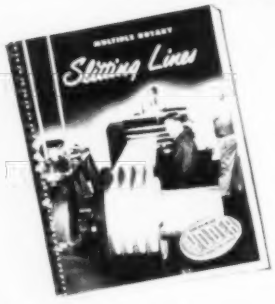
TEXTILES — INDUSTRY IN TRANSITION

Page 40

YODER SLITTING LINES



pay big dividends working only one day per week!



The Yoder Slitter Book is a comprehensive treatise on slitter operation and economics, with time studies, cost analyses and other useful data. It is yours for the asking.

In one plant, two Yoder tube mills and about 50 punch presses are being supplied with slit strands by one Yoder Slitting Line operated an average of only *seven hours per week.*

In another plant, a Yoder slitting line, *operated from six to eight hours per week,* is supplying two intermittently operated roll forming machines with total requirements averaging 100,000 feet per week.

These typical examples demonstrate, first, the big potential output of a relatively small, inexpensive Yoder standardized Slitting Line and, secondly, its big profitability. Assume production of only 35 tons of slit strands per 8 hour shift, one day per week, and the total per year would be 1750 tons. Estimating the saving in slitting cost at only one-half cent per lb., the total annual saving would be $17,500.00.

Besides the big convenience of doing your own slitting, such savings will often repay the investment in a few months.

THE YODER COMPANY 5517 Walworth Avenue • Cleveland 2, Ohio, U.S.A.

ENGINEERING **YODER** MANUFACTURING

ROTARY SLITTING LINES

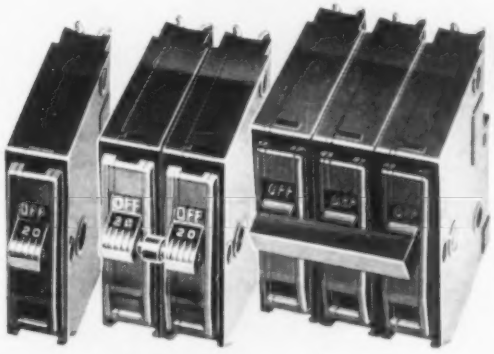
COLD ROLL FORMING MACHINES

ELECTRIC-WELD PIPE AND TUBE MILLS

B 653798

SQUARE D —INVENTOR OF THE MULTI-BREAKER— NOW OFFERS— QO —THE FINEST CIRCUIT BREAKER EVER BUILT!

1, 2 and 3 Poles FOR EVERY REQUIREMENT



1-POLE	2-POLE	3-POLE
15-50 Amperes	*15-70 Amperes*	*15-50 Amperes*

IMPORTANT DESIGN FEATURES

- ✓ Plug-in circuit breaker mounting
- ✓ Quick-make, quick-break mechanism
- ✓ Temperature-compensated for high ambients
- ✓ Calibrated magnetic trip for quick response to short circuits
- ✓ Trip indication on overload or short Handle moves to middle position
- ✓ Non-interchangeable design discourages use of 30, 40 and 50-ampere units where 15 or 20-ampere breakers have been installed
- ✓ Silver-plated connections

2 THROUGH 42 CIRCUITS

1 Phase • 3 Wire • Sequenced Phasing
3 Phase • 4 Wire • Sequenced Phasing

Here is a complete line of load centers and panelboards for residential, commercial and industrial applications. They are available in flush, surface and raintight enclosures. Every device is Underwriters' Laboratories approved and meets Federal Specifications WP-131A, Class A.

***Write* for the complete story**

EXPORT DEPARTMENT • SECAUCUS N.J. CABLE • SQUARED NEWYORK

SQUARE D COMPANY

WHEREVER ELECTRICITY IS DISTRIBUTED & CONTROLLED

another Mallory first
for precision instruments

'Homing' Safely...*on a Radio Program*

New, automatic direction finder—using Mallory vibrators to help supply dependable power—eases aerial navigation for amateur pilots by using radio stations as a musical beam home.

As you head for home in your car, your radio is probably tuned to your favorite radio station. Overhead, the amateur pilot may well be listening to the same station . . . but not just for entertainment.

He is using a new, simplified, automatic direction finder to lead him safely to his destination. All the pilot has to do is tune the instrument to a radio station in the town to which he is flying . . . and follow the course indicated by a single dial. No complicated navigation data. No search for landmarks in unfamiliar country. Just follow the music!

You enjoy your car radio . . . the pilot has his easy-to-use direction finder . . . police and firemen have vital two-way radios . . . thanks to the Mallory-developed vibrator. This little electronic device makes mobile communications practical by converting battery power into the form required by radio.

The radio vibrator is but one example of Mallory pioneering in designing and producing essential components for the nation's growth industries. It is an example, too, of Mallory's ability to combine volume production economies with watchmaker precision in the fields of electronics, electrochemistry and specialized metallurgy.

P. R. MALLORY & CO. INC.
MALLORY

SERVING INDUSTRY WITH THESE PRODUCTS:

Electromechanical • *Resistors, Switches, Tuning Devices, Vibrators*
Electrochemical • *Capacitors, Mercury and Zinc-Carbon Batteries*
Metallurgical • *Contacts, Special Metals, Welding Materials*

P. R. MALLORY & CO. Inc. INDIANAPOLIS 6, INDIANA

McGRAW-HILL INTERNATIONAL

Management Digest®

THE BEST FROM 68 BUSINESS MAGAZINES

MAY 1957

VOL. 12 NO. 5

IN THE WORLD THIS MONTH

Meet the Business Diplomats: The ICC meets in Naples—to discuss everybody's business.....11

For Business, Opportunity Comes on Wheels: World vehicle census passes 100-million mark.13

Management Men at Work: A Brazilian, an American, a Netherlander, and a German.....15

Foreign Aid: Battle Lines are Drawn: Now a balky U.S. Congress, later some sweeping changes 16

MARKETING

Towards Better Marketing Control: Can you measure advertising effectiveness?.....19

NEW PRODUCTION TECHNIQUES

High-Intensity Arc Gets Ready for Industrial Use: Higher temperatures from a new process tool 23

Mobile Plant Follows its Raw Materials: Plant on wheels cuts costs.....24

New Concepts for Press Automation: Now metal-working presses may succumb to automation..26

Looking Ahead in Technology: News about packaging glass, gas-lubricated bearings, cheap protein sources, and more.....27

MANAGEMENT METHODS

Picking Groups to Work Together: What makes individuals into successful team-members....28

Retirement: Mr. Parkinson Has a New Approach: Try it—if you dare.....29

Is It Really a "Skill"? Some thoughts on human relations by a business educator.....31

Savings When You Buy: Where to draw the line between small orders and large orders.....32

RESEARCH

Science Looks Beyond the Diamond: From super-pressure research—new "super-materials" harder than diamonds.....35

Fats: Villain in Heart Trouble? Science has a suspect, but no positive proof.....36

REPORT TO MANAGEMENT

Textiles: a Management Challenge: One of the world's oldest, most basic, industrys faces the future 40

PLUS . . .

The Editor's Page..... 1
World Trends 7
Financial Digest 22
You and Your Personal Affairs.....33
Product Digest 45
Your Management Reading.....51

PICTURE CREDITS: Russell Melcher—Cover

CHARLES S. MILL.....Publisher
PAUL R. MILLER, JR.....Editor
JOSEPH A. COHN.....Managing Editor

EDITORIAL STAFF
Thomas B. Winston..associate editor
D. Bujara .....editorial assistant
I. Dunay .....editorial assistant

ECONOMICS STAFF
Walter Diamond .....Director
Foreign Economics Dept.
Dexter Keezer .....Director
McGraw-Hill Economics Dept.

NEWS BUREAUS
Atlanta .....Charles T. Dixon
Beirut .....O. M. Marashian
Bonn .....Morrie Helitzer
Dallas .....Kemp Anderson, Jr.
Detroit .....Harry Homewood
London .....William Coughlin
Los Angeles .....John Shinn
Melbourne .....Alicja Grobtuch
Mexico City .....John H. Kearney
Paris .....Robert E. Farrell
Rio de Janeiro .....Peter Weaver
San Francisco ...Margaret Ralston
Tokyo .....Dan Kurzman
Washington .....George B. Bryant
Correspondents also stationed in 45 other cities throughout the world.

ADVERTISING REPRESENTATIVES
New York .....K. P. Bliss
Atlanta .....D. C. Billian
Boston .....K. P. Bliss
Chicago .....Stan Kimes,
J. P. MacLeod
Cleveland .....W. S. Bliss
Dallas .....G. L. Jones
Detroit .....D. M. Oldroyd
Los Angeles .....Carl Dysinger
Philadelphia .....George Barnes
Pittsburgh .....W. S. Bliss
San Francisco .....John Otterson
St. Louis .....Stan Kimes
Frankfurt .....George Linder
London .....Herbert Lagler
Paris .....Claude Dupuy

Business Manager....W. J. Maher
Production Manager...H. E. Schorr

McGraw-Hill International
MANAGEMENT DIGEST

McGraw-Hill International MANAGEMENT DIGEST (formerly McGraw-Hill DIGEST), Overseas and Latin American Editions, is published monthly by McGraw-Hill International Corporation, James H. McGraw (1860-1948), Founder. Circulation in all countries of the world except the United States and Canada.

Executive, editorial, advertising and circulation office: 330 West 42nd Street, New York 36, N. Y., U. S. A. Donald C. McGraw, Chairman of the Board; Paul Montgomery, President; Eugene P. Warner, Senior Vice-President; Joseph A. Gerardi, Treasurer; John J. Cooke, Secretary; A. R. Venesian, Vice-President and Circulation Coordinator.

Publication Office: 99-129 North Broadway, Albany 1, N. Y., U. S. A.

Subscriptions may be ordered through Subscription Manager (See below) Subscriptions to MANAGEMENT DIGEST are solicited only from management men in business and industry. Subscription orders must indicate position and company name. Subscription rate: $5. for 1 year; single copy $1.00 (U.S. currency). Second-class mail privileges authorized at Albany, New York. Printed in U.S.A. © Copyright 1957 by McGraw-Hill International Corporation. All rights reserved. Reproduction of items in full or part without written permission prohibited in all parts of the world.

Send subscription correspondence and change of address to Subscription Manager, McGraw-Hill International MANAGEMENT DIGEST, 330 West 42nd Street, New York 36, N. Y., U.S.A. For change of address, please mail your complete new address as well as a clipping of the old envelope showing your old address.

Member, Audit Bureau of Circulations

NEW YORK CITY
MAY 1957

The Readers Report . . .

Good . . .

Sir . . .I would just like to thank you for your excellent report on our School [February p13] which we all enjoyed tremendously.

STEPHAN CAMBIEN, Dean
ECOLE D'ADMINISTRATION DES AFFAIRES
LILLE, FRANCE

Sir . . . Now that you are publishing some articles on the importance of managers going back to school, I thought it would be very interesting if you could publish a list of schools giving special courses for managers in different countries.

I would like to congratulate you on Management Digest—which becomes more interesting and practical with each issue. One thing that must be praised is the use of the metric system in all your articles—a good effort toward rational measurement.

HERNAN LONDONO RESTREPO
MEDELLIN, COLOMBIA

● We are following up Mr. Londono's suggestion.

. . . Not so good

Sir . . . On page 47 (January, Overseas Edition) you reported on a big, new Luxury Coach manufactured by the German firm of "Kussbohrer."

The correct name of the firm is **Kassbohrer. Kassbohrer** means a "man who drills a cheese," while Kussbohrer, literally translated, means a "man who drills a kiss."

I am sure this slip of the pen brought you great success in all German-speaking countries.

HANS VON SANDEN
HEIDELBERG, GERMANY

Sir . . . Your condensation "How to Succeed in Business Politics" [January, p33] shocked me beyond expression. It was not the fact that you recognize the existence of followers of the teachings of Machiavelli; it was your bland acceptance—and by implication, recommendation — of what is, in ultimate analysis, double dealing, lying, and living an hypocrisy.

Let us pity the youngsters that are taught these principles, and also the organizations that they will manage. They will have a measure of success—but well below what they could have by more friendly and loyal relations.

WALTER SUTTON
PORVIR
RIO DE JANEIRO, BRAZIL

● We **do not** believe in "Machiavellian management." We **do** believe in reporting on how some managers behave. And we hope that the manager who indulges in double-dealing squirmed a little when he read our article.

Meet "Mr. MD"

Sir . . . Re your Editor's Page of the November 1956 issue. Please compare your description of the Management Digest reader with the following: I am 36 years old. I own my own home and automobile, and have a wife and two children. I read, besides my native Spanish and English, French and German. I am the Executive Vice President of a group engaged in various activities in Argentina, Uruguay, Paraguay, and Chile. In the last year I took two business trips—to the U. S. A. and Europe. I expect to take at least one this year. Being a very fast reader, I scarcely spend one hour a month to do my almost cover-to-cover reading of Management Digest.

Don't I deserve to be named "Mr. Typical MD Subscriber?"

JAIME PERRIAUX, Vice President
STAUDT Y CIA. S.A.C.
BUENOS AIRES, ARGENTINA

● Not quite. Our research indicates that "Mr. Typical MD Subscriber" may be two or three years older, and spends a bit more time reading each issue. Otherwise, the statistical shoe fits perfectly.

"T" for Taiwan

Sir . . . Here in Taiwan, a rice-producing country, I wish to apply the "formula" from your January issue: Natural Resources plus Human Energy multiplied by Tools equals Man's Material Welfare (NR $+HE \times T=MMW$).

But in the case of the new wax-from-rice recovery process, discussed in the same issue, I do not know what "T" is. Your advice on "T" would not only be helpful for me but also for (this island).

C. WEN, Manager
HWA SHENG DEVELOPMENT CO.
TAIPEI, TAIWAN

● Information about "T", in this case a development of the U. S. Agriculture Dept., is on the way.

Raintight Clampmatic Vacu-Break—a fusible or nonfusible switch completely weather-proof. Ratings from 30 to 200 amps.

Junior Clampmatic Vacu-Break—a high-quality, fusible, general-purpose switch. Ratings range from 30 to 600 amps.

Master Clampmatic Vacu-Break—unequaled for quality, dependability and performance. A fusible or nonfusible heavy-duty disconnect for applications up to 1200 amps.

Get safety firsts with Clampmatic Vacu-Break Safety Switches

Three exclusive *safety firsts* are the mark of *all* BullDog switches. They assure top efficiency and performance . . . bring *extra* protection and longer life.

Vacu-Break® arc control, for one, smothers arcs instantly . . . minimizes burning and pitting. Unique Clampmatic® action provides *bolt-tight* contact pressure. And the dependable Bull-Dog switch mechanism guarantees positive switching.

In *every* way—for *any* application, one of BullDog's big 3 safety switches will meet your exact requirements. *And with less maintenance.* Write to BullDog Export Division (address below) for free literature and details.

© BEPCO

Export Division: 13 East 40th Street, New York 16, N.Y.
(Cables "ARLAB" N.Y. All Codes)

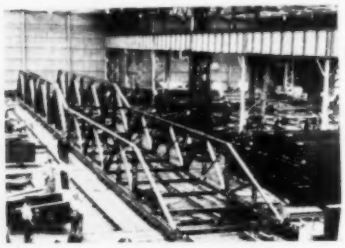
IF IT'S NEW . . . IF IT'S DIFFERENT . . . IF IT'S BETTER . . . IT'S

BULLDOG

ELECTRIC PRODUCTS COMPANY

A Division of I-T-E Circuit Breaker Company

USS STANDARD ADAPTABLE SPAN BRIDGE. Ideal for exploratory or development work where advance knowledge of bridge requirements is unknown. Can be stockpiled . . . interchangeable parts provide source for a variety of bridge lengths. A single-lane structure excellent for temporary or permanent use.



USS LAUNCHING NOSE speeds the completion of the Adaptable Span. This lightweight, trussed structure is counterbalanced by the Span as it is cantilevered across a chasm. Easily dismantled for reuse.

USS STANDARD BEAM BRIDGE. Ideal for short span deck highway bridges. Requires a minimum of fabricating shop work. Minimum field connections reduce erection problems.

USS STANDARD DECK TRUSS BRIDGE. Generally used in longer spans for overall economy where underclearance permits use of deck type structures.

USS STANDARD HIGHWAY BRIDGES

Cut costs . . . speed construction

- **New — a complete line of modern highway bridges standardized for every need.**
- **New Adaptable Spans — excellent for either emergency or temporary use.**

United States Steel now provides the fastest and most economical means for steel-bridge erection – *standard* highway bridges that can be ordered by catalog. In most cases you'll find the USS HIGHWAY BRIDGE MANUAL lists a *standard* span near enough to your measurement to do the job.

This eliminates the cost and time for special designs, estimates, drawings and shop templates – as well as the preparation of orders for rolling material. And USS Standard Highway Bridges make possible early receipt of anchor bolt plans . . . permit prompt construction of foundations . . . allow shipments to be made more quickly.

You'll find many new ideas in USS Standard Highway Bridges. The new Adaptable Span allows fast, variable-length construction. A new type of launching nose permits cantilever erection of the Adaptable Span . . . requires only the simplest highway equipment for speedy erection – and it's reusable.

Other USS Standard Highway Bridges include Pony Truss Bridges, Deck Girder Bridges, Through Truss Bridges, Beam Bridges, and Deck Truss Bridges.

For complete information, write now for your USS HIGHWAY BRIDGE MANUAL, available in English or Spanish.

Look for this trademark . . . your guide to quality steel

UNITED STATES STEEL EXPORT COMPANY
30 CHURCH STREET, NEW YORK 8, U. S. A.

▶ WORLD TRENDS

A PACKAGE OF PREDICTIONS . . .

. . . **FROM THE ECONOMISTS.** Per Jacobsson, managing director of the International Monetary Fund, predicts **the Western world will see prices leveling off this year**—and adds that he is more hopeful about the industrial nations' ability to restrain inflation. Consumers and governments, he believes, are more concerned about the price spiral, more willing to take action.

But Lionel Edie & Co., New York, predicts—on the basis of population studies—**that industrial nations can expect little relief from inflation,** because of a chronic labor shortage. Edie points out that the "dependent" age group (under 15 and over 65) is increasing in relation to the productive age group (15 to 65). In the United Kingdom, for example, the "dependents" have jumped from 23% of the population in 1939 to 34% now. If the age distribution were the same now as prewar, there would be 5.6-million more "productives."

This relative shortage contributes to high wages and high prices. And Edie sees no substantial relief before the early 1960s.

. . . **FROM THE JAPANESE.** **Exports in the year beginning this month will probably total $2,800-million,** predicts Trade Minister Mikio Mizuta. He promises strong new measures to increase Japan's overseas sales. He reports, too, that Japan will need $3,200-million in foreign currency to buy the raw materials it will need.

Though Japan is now the world's leading shipbuilder, some businessmen are worried. Mitsui Shipbuilding Co. complains that, in their rush to get business, **shipyards are selling themselves short,** often losing money, risking a future depression if labor and materials costs rise.

. . . **FROM THE OIL MEN.** You begin to hear worries that the world's tanker-building boom could result in an **embarrassing surplus capacity by 1961, and a sharp drop in tanker shipping rates before that.** But Petroleum Week magazine reports that the independent tanker operators scoff at such predictions, arguing that all forecasts of future oil demand are too conservative.

They get some support from Walter J. Levy, international oil consultant, writing in the current Foreign Affairs. **Both the U.S.A. and Europe are becoming more dependent on Middle East oil,** says Levy. Despite speedy atomic development, Europe will depend on oil for over 25% of its energy supply in 1965 (it's 20% now).

That will mean 4.7-million barrels a day, of which 4.3-million barrels must come from the Middle East. Even the U.S.A. will require imports of 3-million barrels a day in 1965, Levy warns—and 800,000 barrels of that from the Middle East.

Premier Guy Mollet of France has other ideas, and a highly optimistic prediction: He is excited about new oil discoveries in the Sahara, and **guesses that the area could supply half of Europe's energy needs in years to come.**

. . . **FROM THE CHEMISTS.** Chemical Week magazine predicts **a bright future for a new family of chemicals called polycarbonates.** Germany's Bayer has a pilot plant at work producing over 30 different varieties. The polycarbonates are strong, colorless, transparent, with good electrical and

Turn the page for more WORLD TRENDS

mechanical properties. They are potentially important, says Chemical Week as a basis for new films, fibers, protective coatings.

WEALTH IN THE GROUND

Minerals offer perhaps the brightest opportunity for many of the 20 Republics of Latin America. Indeed, economic growth may depend on the extent to which minerals are unlocked from the ground and sold.

This is the opinion of economists of the Chase Manhattan Bank, New York. They are worried about the lagging state of mineral development: Since 1946, output of basic industrial minerals in Latin America has risen only 27%, while manufacturing production has risen some 60%. Yet that industrial rise increases demand for minerals—and for the imports that mineral sales can pay for.

No question that the opportunity is there. Latin America is one of the earth's richest mineral storehouses. World demand for minerals is tied to industrial production, which has been rising 6% yearly. Compare that with demand for foodstuffs (or apparel fibers)—which is closely tied to the 1.2% annual increase in population.

This concerns these American observers. So does the fact that most of the past ten years' gain in mineral output took place in just a few countries: Peru, Venezuela, Brazil, and Cuba. Other important producers—Bolivia, Chile, and Mexico—showed very small gains.

And look at the "minerals trade balance" of important countries. Highly-industrialized Brazil and Argentina had to spend $184-million on industrial minerals in 1955, only sold $56-million worth. (Petroleum purchases, of course, make that deficit much, much larger.)

What to do? Chase's prescription is familiar—and difficult: Encourage as much capital as possible, from domestic sources and from abroad, to get busy on minerals.

THE PROFESSORS ARE COMING

A travelling professor from the U. S. may appear at your office during the next year or so. Help him—his mission is an important one.

The Ford Foundation of the U.S.A. and Columbia University's law and business faculties have launched a world study of joint business ventures. International manufacturing partnerships, technical assistance and management contracts, licensing deals, majority or minority shareholdings—any industrial enterprise among citizens of more than one nation is included.

The idea is to find out, and tell the world, what makes for a good joint venture, how important they are to world development, what legal and administrative changes will make them more efficient.

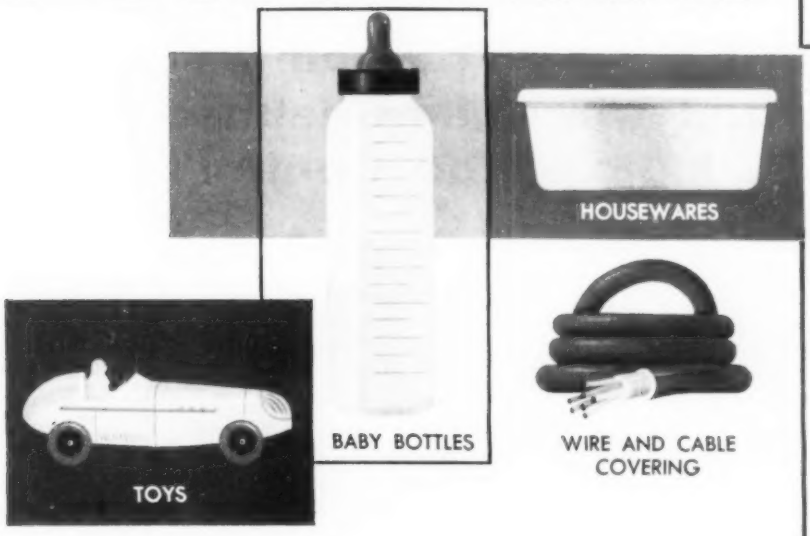
Country studies are planned for Burma, India, Japan, the Philippines, Mexico, Brazil, Turkey. Others may follow. In the next few months, members of the research team will try to visit with businessmen in Europe and Latin America. Meanwhile, the United Nations, the World Bank, and other agencies are assisting the project.

NEW BREW IN BRAZIL

Asia "borrowed" Brazil's rubber, and became the world's premier producer. Now Brazil is taking a leaf—the tea leaf—from the Far East.

Brazil has just made a second substantial tea shipment to the U.S.A. And as exports increase, Brazilian tea may be able to compete with Asian varieties in European and American markets. Standard Brands (a U.S. coffee and tea distributor) has been working in Brazil with Japanese farmers on development of a high-grade tea leaf. The climate that made Sao Paulo's coffee fortune, the company believes, can also grow good tea.

revolutionary FORTIFLEX



See your representative listed below for: Plastics, Polyester Resins, Chemicals, Textiles, Cellulose Acetate Flake.

Argentina, Buenos Aires . . . Importadora Técnica Industrial "ITI" S.R.L. . . . Plastics & resins.
Argentina, Buenos Aires . . . . Compañia Sud-americana de Industria de Comercio S.A. "Insud" . . . Chemicals & C. A. flake.
Brazil, São Paulo . . . "Brasimet" Comercio e Industria S.A. . . . Chemicals, plastics, resins & C. A. flake.
Brazil, São Paulo . . . P. Von Horen . . . Textile products.
Canada, Montreal, P.Q. . . . *Canadian Chemical Co., Ltd. . . . Chemicals, plastics, resins & textile products.
Canada, Toronto, Ont. . . . *Canadian Chemical Co., Ltd. . . . Chemicals, plastics, resins & textile products.
Canada, Vancouver, B.C. . . . *Canadian Chemical Co., Ltd. . . . Chemicals, plastics, resins & textile products.
Chile, Santiago . . . Gottlieb y Schacker . . . Textile products.
Chile, Santiago . . . M. Hochschild y Cia. Ltda. . . . Chemicals, plastics, resins & C. A. flake.
Colombia, Cali . . . *Celanese Colombiana, S.A. Chemicals, plastics, resins & textile products.
Costa Rica, San Jose . . . Servicios Técnicos . . . Chemicals, plastics & resins.
Costa Rica, San Jose . . . Gonzalo Garcia . . . Textile products.
Cuba, Havana . . . Lainz y Compañia . . . Chemicals, plastics, resins & textile products.
Cuba, Havana . . . F. Otero Cossio . . . Fabrics.
Dom. Republic, Ciudad Trujillo . . . M. Rodriguez Perez . . . Textile products.
Ecuador, Quito . . . Schiller & Cia . . . Chemicals, plastics & resins.
Ecuador, Quito . . . Oscar Gonzalez Artigas . . . Textile products.
El Salvador, San Salvador . . . Charles F. Rich & Co. . . . Chemicals, plastics, resins & textile products.
Guatemala, Guatemala City . . . Enrique Bauer Arzu . . . Chemicals, plastics, resins & textile products.
Haiti, Port-au-Prince . . . N. Acra & Fils . . . Textile products.
Honduras, San Pedro Sula . . . Schmid & Tentori . . . Textile products.
Honduras, Tegucigalpa . . . Schmid & Tentori . . . Textile products.
Mexico, Mexico D.F. . . . *Celanese Mexicana, S.A. . . . Chemicals, plastics, resins & textile products.
Nicaragua, Managua . . . J. Alfonso Zuniga P. . . . Textile products.
Panama, Panama, P.R. . . . Pablo Paz . . . Fabrics.
Paraguay . . . Armando Bachman Suc. . . . (offices in Montevideo, Uruguay) . . . Chemicals, plastics, resins, C. A. flake & textile products.
Peru, Lima . . . George Checkley . . . Chemicals, plastics, resins, C. A. flake, textile products.
Puerto Rico, San Juan . . . J. G. Perez—Villamil . . . Fabrics.
Uruguay, Montevideo . . . Armando Bachman Suc. . . . Chemicals, plastics, resins, C. A. flake & textile products.
Venezuela, Caracas . . . *Celanese Venezolana S.A. . . . Chemicals, plastics, resins & textile products.

*Affiliated Companies — Celanese Corporation of America

New Celanese polyolefin is five times stiffer than polyethylene and can even be sterilized

A great new Celanese plant at Houston, Texas, is now producing a remarkable new thermoplastic that does many things polyethylene now does—and does some far better!

Unlike conventional polyethylene, FORTIFLEX is manufactured at low pressure with molecules tightly packed. FORTIFLEX is stiffer, resists many oils and acids, has three times more tensile strength. It also exhibits excellent impact strength at -40° C.

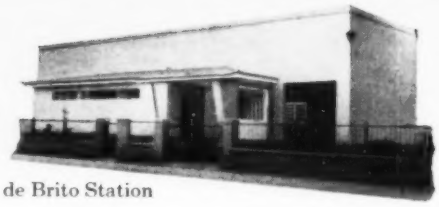
From baby bottles that can be sterilized at 15 psi pressure to chemical carboys, from toys to housewares, FORTIFLEX opens up thousands of rewarding uses.

Pan Amcel plastic representatives will have substantial test quantities on hand, can take your order for early delivery of production quantities of FORTIFLEX. Ask them for technical bulletins to assist you now in applying fabulous FORTIFLEX to your business—your product—your molding and fabricating processes.

Celanese® Fortiflex®

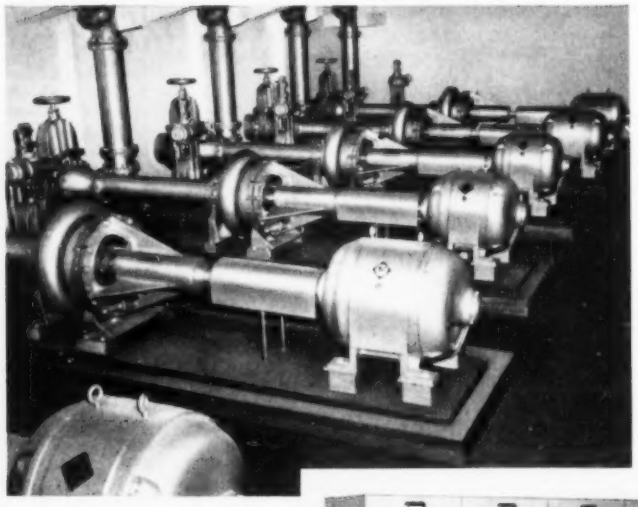
PAN AMCEL CO., INC., 180 MADISON AVENUE, NEW YORK 16, N. Y.
AFFILIATE OF CELANESE CORPORATION OF AMERICA

In Rio de Janeiro...



Saturnino de Brito Station

Every modern sewage pumping station is equipped with Allis-Chalmers Pumps, Motors and Control

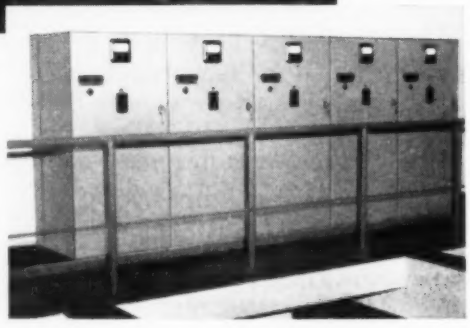


These 6 Allis-Chalmers motor-pump combinations are installed at Saturnino de Brito Station which was designed and built by Dr. Enaldo Cravo Peixoto, Director of the Sanitary Sewage Department, and Yamagata Engenharia S. A., General Contractors.

Rio de Janeiro, with over 3 million people in a narrow strip of land between mountains and sea, requires the largest number of sewage pumping stations of any city in the world. All the main stations in Rio are equipped with Allis-Chalmers pumps, motors and control.

This is an example of how Allis-Chalmers can combine machinery with broad engineering experience to help fast-growing cities everywhere solve public service problems.

In the same way, Allis-Chalmers offers machinery and engineering aid to all of the world's major industries: electric power, mining, cement making, manufacturing. For help with your equipment problems, big or little, in any industry, contact the distributor in your country, or write Allis-Chalmers, Industries Group, Export Department, Milwaukee 1, Wisconsin, U.S.A.



Allis-Chalmers motor control for the Saturnino de Brito Station. Inaugurated in 1956, this station is one of the newest sewage pumping stations in the extensive chain of pumping stations serving Rio and surrounding areas. All of these modern installations are equipped with Allis-Chalmers pumps, motors and control.

ALLIS-CHALMERS

A-5282

DISTRIBUTORS THROUGHOUT LATIN AMERICA

These firms distribute equipment of the Company's Industrial, Power and Electrical, and General Product Divisions. Distributors of Tractor Group products also are located in principal cities.

ARGENTINA, Buenos Aires—Allis-Chalmers Mfg. Co. (Argentina) E. Lix Klett & Co., S.A.

BOLIVIA, La Paz—Corporación Comercial Boliviana, S. A. Cobaña).* Compañía Comercial e Industrial "Titan" S. A. Texrope products only).

BRASIL, São Paulo y Rio de Janeiro—Sociedade Técnica e Comercial Serva Ribeiro, S. A. Recife (Pernambuco)—Schenker, Barbosa & Cia. Porto Alegre—Bromberg Comercial, S. A.

CHILE, Santiago—Salinas, Fabres & Cia. Ltda.* (Pumps only). Sociedad Manufacturera Allis-Chalmers.

COLOMBIA, Barranquilla—Osorio & Cia. Ltda.. Bogotá—Alsaco, Ltda. * Medellin y Cali—Peter Santa Maria & Cia. Ltda.*

COSTA RICA, San José—Distribuidora, S. A.

CUBA, Habana—L. G. Aguilera & Co., S. A.

DOMINICAN REPUBLIC, Ciudad Trujillo—Dominican Motors Co., C por A.*

ECUADOR, Quito—Luis A. Hernandez.*

EL SALVADOR, San Salvador—Compañía Importadora de Maquinaria.*

GUADELOUPE, Pointe à Pitre—Société Commerciale Guadeloupeenne.*

GUATEMALA, Guatemala City—Compañía Distribuidora Kepaco, S. A.*

HAITI, Port-au-Prince—Electra.

JAMAICA, Kingston—Kingston Industrial Agencies.*

MEXICO, México D. F.—Allis-Chalmers de México, S. A.

NICARAGUA, Managua—Automotive and Industrial Equipment Co.*

PANAMA, Panamá City—F. Icaza & Co., Inc.*

PARAGUAY, Asunción—importadora y Exportadora del Litoral, S. A.*

PERU, Lima—Peruvian Trading Corp., Ltd., S. A.

PUERTO RICO, Ponce—Porto Rico Iron Works, Inc.,*San Juan—Garcia Machinery, Inc. (Texrope products only.)

SURINAM, Paramaribo, Nieuw-Nickerie—N. V. Ingenieurs bureau H. N. Van Dijk.*

TRINIDAD, Port of Spain—J. N. Harriman & Co., Ltd.*

URUGUAY, Montevideo—J. Felix Castillo (H).

VENEZUELA, Caracas—Compañía Anónima Tecnomat.

*Indicates firms which also sell some Tractor Group products.

ALLIS-CHALMERS MANUFACTURING COMPANY, Industries Group, Export Department, Milwaukee 1, Wisconsin, U. S. A. Factories in U. S. A., England and Canada.

- The International Chamber of Commerce convenes this month in Naples—to work on the problems of management men everywhere.
- Here MANAGEMENT DIGEST reports on the "Businessman's International," and on the business statesmen who are representing you.

Meet the Business Diplomats

A visitor to Naples during the second week of May has a unique opportunity to study, at close range, an assembly of the world's most influential businessmen. That is if the visitor can find room: The city is crowded down to the last pensione with 2,000 delegates to the XVI Congress of the International Chamber of Commerce (ICC).

There are many types among the men-of-affairs arriving in Naples:

The Asian—a new member of the ICC—who hopes to increase the cooperation between himself and the Europeans and Americans who dominate the organization.

The American, curious to find out how foreign businessmen are thinking, and how their thinking may affect him.

The Englishman, travelling with his lady on a company expense account, anxious to enjoy the Neapolitan sun and the cocktail contacts of an ICC Congress.

The German who, having heard that an American competitor was attending, rushed to join the Congress in hopes of "discussing some possibilities" with the man from the U.S.A.

A band of dedicated "business statesmen" from many nations, all convinced that the ICC is the one organization through which they can promote expanding, healthier world trade.

Edmond Giscard d'Estaing (cover picture) is such a business statesman. At 63, he is president of an investment bank (Soc. Financiere pour la France et les Pays d'Outre-mer), director of several companies, an economist, author, and leader of the European Movement. Giscard d'Estaing is the kind of man who gives the ICC some of the intellectual authority it needs when it speaks for the world's business community.

He also heads the French national committee of the ICC. As such, he must represent—at the same time—the liberal, French "internationalist" (the kind of man who helped form the ICC after World War I) and also the French businessman who depends on the machinery of economic nationalism as a way of life.

This conflict plagues any organization that claims universality—and the ICC is no exception. At Naples, the French delegation will be asked many questions—about the new Common Market treaty, about France's role in the "new Europe." Giscard d'Estaing and his colleagues will have the difficult job of speaking for France.

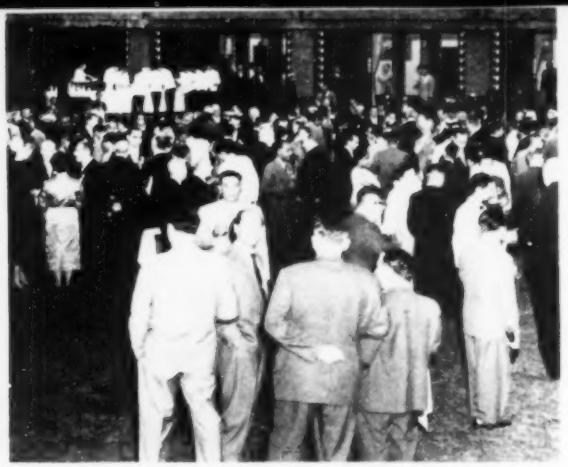
And it is possible that, once the Congress is over, Giscard d'Estaing will be speaking for businessmen everywhere. There are reports that he is a strong candidate for the ICC presidency, to succeed the U.S.A.'s Warren Lee Pierson (picture, page 12) and become the first French president since Etienne Clementel, the organization's first chief executive and one of its founders in 1919.

Defining the ICC is easy; describing its benefits to business is difficult. Those benefits, a Japanese member comments, are "like air or sunlight—something we cannot grasp in our hands but which we need."

The ICC has been called the "Businessman's International." It is a voluntary, non-government organization representing every sector of private enterprise. Bankers, manufacturers, traders, insurers, shippers, advertisers, carriers in 64 countries on five continents are members, either through "national committees" (in 36 nations) or independently where no national groups yet exist. Indirectly, more than 1-million enterprises are represented.

In general, the ICC is dominated by Europeans (who consider themselves most dependent on world commerce) and Americans (who supply a good deal of ICC's money, and who represent the world's most powerful trader). But membership is broadening: Seven Asian countries joined the ICC before its first Congress in the Far East, held in Tokyo two years ago. Viet Nam, a newcomer, is attending its first Congress this month. Morocco and Tunisia are joining as independent national committees; Latin America—where ICC influence is weak—and the Middle East—where influence is non-existent—will be getting much more attention from the organization in the future.

Membership is obtained through the national committee or directly through ICC's Paris headquarters. The national groups are made up of chambers of commerce, trade associations, individual firms. These national groups send delegates to the ICC's 31 working



An ICC Congress provides opportunity for discussion (above a session on distribution and advertising trends), and for . . . . . lots of informal social contacts with businessmen of all nations. The gala above was part of the 1955 Congress in Tokyo, ICC's first in Asia.

commissions (on taxation, investment, advertising, commercial arbitration, banking, etc.), where a consensus of opinion is worked out. These reports go to an international governing body for approval. Finally, they are put before a bi-annual Congress, and become part of the ICC's program.

The ICC stands or falls on this basic premise: Everyone in the world benefits from free-flowing trade. Against that background, ICC work falls into this pattern:

At the United Nations, the ICC is one of 10 top-ranking consultative organizations. It can present memoranda to member nations, get items on the ECOSOC agenda, send men to express business opinion. There have been some real accomplishments at the U. N.: ICC resolutions against discrimination in insurance and barriers to international transport, and for simplification of border formalities, are being adopted.

And the ICC focuses U. N. opinion on broader matters. ICC experts put together a code of fair treatment for foreign investment which has become a working document in U. N. discussions; several nations have included parts of the code in new laws. No nation, obviously, has to abide by the code. But the ICC has made sure that no nation is ignorant of what businessmen want.

National governments generally treat ICC national councils as respected consultants on business matters; the councils submit policy statements, and analyses of international business agreements and events. Official ICC influence on governments is hard to measure—but it can be considerable. That influence is apt to be strong in a smaller European nation that depends heavily on world trade, not so strong in the U. S. Congress which is much less responsive to international business opinions.

That is not to say that national councils do not take strong public positions on domestic legislation affecting trade. The U. S. Council, for one, is busy with radio programs, special reports to business, and other activities designed to swing public opinion behind more liberal trade policies.

International business groups are probably the most fertile field for ICC action. Here, amid the practical problems of commerce, the ICC can get direct action.

An accounting of ICC action is impressive: It has secured standard definitions of shipping terms; codes of advertising standards; a convention to simplify exchanges of samples; a continuing commercial arbitration procedure; common rules for documentary credits. In the case of the credits, the 1951 ICC Congress published standards agreed on by a panel of bankers.

Sometimes ICC resolutions fall flat—or have only limited success.

MEN OF ICC: Pierre Vasseur (left), secretary general since 1933, is retiring; W. L. Pierson, chairman of Trans World Airlines, is a U. S. leader; retiring ICC president. Rolf von Heidenstam (above) headed ICC 1951-1953, is chairman of Sweden's General Export Assn.; Camille Gutt (1953-1955) is a Belgian banker, one-time finance minister.

On some matters, ICC members can't agree enough to pass a resolution, let alone bring pressure on their governments. On others—usually problems with broad political implications—the ICC may add its voice, but nothing happens.

"We try to stay within the realm of the possible," says one ICC official. "We try to stay away from questions with political overtones. Our most spectacular failure," he admits, "was in 1939 when the ICC came out for peace."

But it would be a mistake to underrate ICC influence. Its pronouncements are hammered out in many small sessions of council members and commissions; there are important, but unpublicized, meetings-of-minds among men of many nations. These men frequently have great influence. One knows the finance minister of his country—indeed, he may be a former finance minister himself. Another plays golf with a president.

The ICC Congress, held every other year, is symbolic of the work that has gone on in the Paris headquarters, and in formal and informal meetings, during the intervening years. The delegates come together, attend discussions of timely topics (at Naples they are hearing about the Common Market; advertising and distribution trends; world taxation; problems of less developed nations) and put their approval on resolutions worked up by the commissions. Meanwhile, the delegates have a week of informal contact—in the corridors, at breakfast, luncheons, cocktails, receptions.

At the very least, international understanding grows. At the most, strong new friendships and business contacts emerge.

Such intangible benefits—the "air and sunlight" that the Japanese pointed out—are at once the ICC's great strength and its weakness when it comes to attracting strong new supporters. The problem is that the organization does not do anything specifically for an individual member: It renders no special service, it does not pressure governments on behalf of one company or industry; it does not directly help a businessman sell his goods. ICC works for principles, for general improvement in the business climate. All businessmen benefit—those who support the ICC, those who do not.

And this leads to another ICC problem—that of finding business leaders who can spend lots of time on ICC work. They must lend their voices to the ICC, formulate policy, help the Paris headquarters.

The kind of man that has given the ICC its drive in the past are those who combine a spirit of business altruism with a sharp sense of their own best interests. A manufacturer who may seem to have much to gain from tariff barriers realizes that his own, and the world's, long-term good may depend on fewer tariff barriers.

There are many such men at Naples. But ICC needs more. One U.S. member puts it this way: "The world chamber—if it is to be really effective in encouraging trade and economic development—needs more men of intellectual authority, men with ideas. That's what we are selling—ideas." ●

The World's Vehicles: 1957

AREA	Total Cars, Trucks, Buses	Cars	Trucks	Buses	Motor-* Cycles	Farm Tractors
AFRICA	1,990,590	1,353,306	614,831	22,453	167,490	159,899
AMERICA (Excl. U.S. and Canada)	3,335,258	1,919,420	1,301,793	114,063	215,929	216,314
UNITED STATES	64,600,721	54,126,857	10,328,432	145,432	460,000	4,500,000
CANADA	4,323,500	3,250,000	1,060,000	13,500	35,000	420,000
ASIA (Excl. China)	2,455,829	1,004,434	1,252,605	149,639	1,846,677	99,923
EUROPE (Excl. Iron Curtain Countries)	19,316,367	14,386,808	4,210,353	221,706	12,326,461	2,515,463
IRON CURTAIN COUNTRIES	3,855,700	693,500	3,116,000	46,200	202,600	1,098,100
OCEANIA	2,949,744	2,081,143	851,394	12,501	195,949	279,349
WORLD TOTAL (Excl. U.S., Canada, & Iron Curtain Countries)	30,047,788	20,745,111	8,730,977	520,362	14,752,506	3,270,948
WORLD TOTAL (Excl. U.S. & Canada)	33,903,488	21,438,611	11,846,977	566,562	14,955,106	4,369,048
WORLD TOTAL (Excl. Iron Curtain Countries)	98,972,009	78,121,968	20,119,409	679,294	15,247,506	8,190,948
WORLD TOTAL	102,827,709	78,815,468	23,235,409	725,494	15,450,106	9,289,048

Separate car, truck, and bus figures not available for all territories. Because only a single total is supplied from some countries, and because elsewhere some unclassified vehicles are included in totals, such totals sometimes exceed sum of cars, trucks and buses. *Includes motor scooters and in some cases, 3 wheeled vehicles and powered bicycles

For Business, Opportunity Comes on Wheels

This month, *The American Automobile* publishes its annual census of vehicles now on the world's highways. For the first time, the number of cars, trucks, and buses has passed the 100-million mark. During 1956, the vehicle population grew by 7.4-million units.

This is a record increase, another sign of people's increasing ability to satisfy their demand for better transport. Note these other census highlights:

—**cars tended to gain more than trucks.** And don't forget the fast-growing number of motorcycles and motor scooters, up strongly in 1956.

—**Europe showed a huge net gain** of 16.7% (after allowing for the less than 40% of new production that replaced scrapped vehicles). Asia gained 14.4%, Canada 13.1%, Latin America 12%, the U.S. just 4%.

—**It all adds up to larger opportunities** for replacement parts business, accessories sales, garages, motor hotels, and—above all—highway building. ●

Management Men a

. . . in Brazil

ERMELINO MATARAZZO (left) is an athletic young man in his early 30s with the look of having new, heavy responsibilities. He reflects on his days of semi-professional football and says "There's no time for that now."

Nor will there be much time in the future. An outsider gets the impression that Ermelino is being groomed for the top management position of Industrias Reunidas Francisco Matarazzo, a business empire that has become a social and economic institution in Brazil. Its 288 factories use more electricity each year than does all of Peru; it has 40,000 regular employees scattered throughout Brazil; its four divisions cover textiles, building materials and minerals, foods, and chemicals.

Of the four, chemicals is the "boom" division. It is here that Ermelino is learning modern management (he also is in charge of textiles, while younger brother Eduardo heads building materials and foods).

Less than five years ago, IRF Matarazzo's chemical group produced less than 6% of total sales. Now the share is 35%; within five years chemicals may produce nearly two-thirds of the total.

Not long ago the company used

IRF Matarazzo is combining local raw materials (like the salt and limestone above) with foreign technical partnerships to build . . .

. . . a basic chemical industry centered around this "chemical park" (above), not far from Matarazzo's Sao Paulo headquarters (right).

n at Work . . .

85% of its chemicals to fill its own needs. Now it supplies the Brazilian market with a growing array of products—made from the company's own raw materials, transported in its own carriers.

As Matarazzo chemical output moves up, Brazilian import requirements have dropped. But the company does import: a few raw materials, and most important, technical partners.

Right now, it is working with B. F. Goodrich Co. of the U.S.A. in Geon do Brasil, making polyvinyl chloride; several more partnerships are pending with other U. S. and European firms. The welcome sign is out at the Sao Paulo headquarters for foreign assistance.

All this is changing a tightly-controlled, rigid, family empire. It was founded near the turn of the Century by Count Francisco Matarazzo, who came from Italy and started business with nothing more than a copper pot to render animal fats. His son, Count Francisco Matarazzo Jr., is titular head of the company but must now take things easy because of his health. It remains for the grandsons—Ermelino and Eduardo, working the gruelling 12-hour day that is the family tradition—to equip IRF Matarazzo to meet the problems of the fast-growing and competitive Brazilian market.

. . . in the U. S. A.

DANIEL K. LUDWIG is a "man nobody knows." He reveals little of his activities. But in this day of petroleum problems and giant tanker ships, he is a man the world must reckon with. At last count, Ludwig's fleet—operating or under construction—was 2.4 million deadweight tons.

That makes Ludwig at least the equal of the famed Greek tanker "kings." And with a personal fortune estimated at $500-million, he is certainly one of America's richest businessmen.

This quiet, 59-year-old American started by chartering small ships, then by building them. He helped develop some important techniques—welding ships instead of riveting, sideways launching, maximizing cargo space. He was one of the first to see the future of "super-tankers." In all his projects, he displays almost unlimited ingenuity. He will gamble, but backs his gambles with hard work.

The nerve center of the Ludwig empire is National Bulk Carriers, Inc., of New York. But the network spreads to a naval shipyard under lease in Japan, another in Virginia, plans for a $50-million base in the Bahamas. There are nine shipping affiliates and operating companies, plus banking in Liberia and insurance in Bermuda. Ludwig is interested in truck-trailer shipping, and has oil, timber, and cattle lands in Venezuela and Brazil. Latest projects: a $33-million refinery project in Panama, and salt evaporation in Mexico.

. . . in Holland

ANTONIE J. ENGEL 60, heads the board of managers of Holland's giant Algemene Kunstzijde Unie (AKU)—which is to textiles what Philips is to electrical goods, and Unilever N.V. to fats, oils and foods. As a manager, Engel accents AKU's international position, and its research.

If, as many believe, the future of rayon depends on its technology, AKU is in a good position. It has 17 European affiliates, strong U. S. interests, and a world of talent among its 47,000 employees. All exchange information with a central, "family" research center at Arnhem.

Now, a great battle is beginning for one of rayon filament yarn's prime markets: Nylon is making a bid for the crucial tire-cord business. This is one reason why AKU is pushing development of rayon staple, which many feel to be the rayon product of the future. To show that it means business, AKU just opened a $21-million staple plant in the U. S. A.

Meanwhile, AKU plans to diversify—into more non-textile products and plastics. Engel says: "We in AKU know a lot, and we are strong because we have this knowledge. But we have to use our knowledge in the right way."

. . . in Germany

FRITZ-AUREL GOERGEN, president of Phoenix-Rheinrohr AG, Duesseldorf, is another German steel man who is beginning to "think big" about world markets. He is busy diversifying, assuring new raw material supplies, and establishing new markets. An expansion program, just announced, will cost $275-million by 1960.

Phoenix is West Germany's Number One steel pipe maker, and its second ingot producer. Like other German steel companies—Mannesmann, for example—Phoenix is moving into North and South America. A Phoenix-owned pipe plant began producing in Canada in 1955, the first overseas pipe subsidiary. Last fall another one, jointly owned with American capital, began Canadian operations. A few months ago, Phoenix set up a U. S. subsidiary—a Western Hemisphere headquarters to buy scrap, coal, shipping space; to seek cooperation with U. S. steelmakers; and—perhaps to sell securities.

Meanwhile, Phoenix has made careful studies of Latin America, especially Brazil and Venezuela. Look for Phoenix to have a pipe plant operating somewhere in South America by 1959. ●

Digested from Business Week, Jan12, p123; Feb16,p141; Mar16,p105 Chemical Week, Mar2 p24

Foreign Aid: Battle Lines are Drawn

PROBLEM: President Eisenhower wants more U.S. aid for foreign economies. But Congress is balky.

OUTLOOK: Aid "as usual" for a while—and then look for sweeping changes in Washington's policies.

The great annual Washington debate over the U.S.A.'s foreign aid program is in full swing this month. And the outcome is more uncertain than at any time since 1948.

President Eisenhower's Administration is relying on aid to meet the crisis in the Middle East, to exploit unrest in East Europe, to counter Communism's economic offensive in Africa and Asia. The President, and many of his advisers, consider economic assistance as the most important weapon of their diplomacy—especially now that, in their view, the crucial job is to help the less-developed (often newly-independent) nations become economically self-sustaining.

Eisenhower expressed his feelings clearly in his Inaugural Address early in 1957. He assumed for the U.S.A. a heavy responsibility for the economic well-being of the entire non-Communist world. Meanwhile, public opinion polls suggest that a majority of the American people support the general idea of aid, and representatives in Congress have continued to endorse the program.

I. The Paradox

But—paradoxically—there are many obstacles to aid spending.

For one thing, the Administration itself is divided: Some powerful members of the "Eisenhower team" are dubious about aid. And they are grimly determined to hold down government spending.

Meanwhile, the legislative branch is scrutinizing the President's request for $4,400-million in foreign aid more critically than ever. The Administration's budget (at $72,000-million) is the largest in peacetime history. The size has shocked the Congressmen, and evoked a flood of letters from the public, all demanding economy. Politically, the aid bill is the easiest place to look for those economies.

Congressional opinion is divided, confused, and hostile. The conservative, "Southern" members of the Democratic Party are moving away from their traditional allegiance to liberal foreign economic policies. The liberal, "Northern" or big-city Democrats are trying to disassociate themselves from the President's policies in order to obtain an independent claim to policy leadership (some are actually calling for larger economic aid, and less military aid). The President's own party, the Republicans, are all talking "economy" in the Congress.

There is uncertainty about the objectives of the U.S. aid program. The Marshall Plan's goal of rebuilding a shattered Europe was clear and finite. The Mutual Security Program, with its emphasis on arms assistance, was easy to understand. But now Europe is prospering, the danger of Communist military adventures seems more remote. This calls into question the need to spend more thousands of millions of dollars abroad.

The long-term nature of the new task at hand—that of helping poorer nations to economic self-sufficiency—frightens the Congress. Even if the U.S. economic development programs in these areas (now at about $500-million yearly) were doubled, it would take the better part of a generation to see the results. And the Congress does not like to look so far ahead.

American supporters of an ambitious, long-term economic aid program—and there are many of them—argue that if aid is to work at all, it must be divorced from short-term political and military goals. It must be aimed exclusively at economic development for its own sake, in "neutral" or "uncommitted" nations as well as among military allies.

These advocates have faith in the idea that this would make for a healthier, more stable world. But politically, their faith is hard to maintain—certainly to a group of economy-minded legislators.

II. The Outlook

This background explains why there are no bold innovations in the President's aid request to Congress. To be sure, President Eisenhower is asking for a freer hand with aid, and in particular for authority to commit funds to big, long-range development projects. And he will probably get some additional flexibility in handling aid.

But the program will remain much the same as that in recent years: primarily a military program, with roughly two-thirds earmarked for military assistance, direct and indirect. Also over half of all the non-weapons assistance is still directed to five U.S. military allies—Korea, Nationalist China, Viet Nam, Pakistan, Turkey. (Of course, there is more to U.S. government spending abroad than the aid program itself. In the last fiscal year, another $1,000-million was added by Export-Import Bank loans, or was generated by the farm surplus disposal program. Another $2,300-million came from spending for U. S. troops overseas, etc.

The Administration is resigned to the fact that there will be some cuts in the present, admittedly "stopgap" program. But many officials see this danger: If U.S. aid spending is not big enough and bold enough to show some positive results within the next year or two, it may prove more difficult to win Congress' support for any program at all.

At that point, the entire orientation of U.S. foreign policy would have to be reappraised. For foreign aid is no longer merely a tool for foreign policy. In many respects, it is foreign policy. ●

Yes, Bethlehem Supplies Steel in ALL Forms

Bethlehem doesn't limit its production of steel to a few general items. It is a world supplier of steel in all standard forms, including bars, alloy steels, tool steels, plates, structural shapes, sheets, strip, tin plate, wire products, rods, pipe, rails.

Bethlehem is a completely integrated steelmaking organization. We have our own ore mines, furnaces, treating ovens, rolling mills, laboratories, and all other equipment needed in the making of steel. Centralized control enables us to fill your wants more promptly and to furnish you with a wide variety of steel products in virtually every form.

No matter where you are, you're always close to a Bethlehem office or representative. It is the job of our offices and representatives everywhere to keep you supplied with the products we make, and to give you friendly service at all times. Bethlehem Steel Export Corporation, 25 Broadway, New York 4, U.S.A. Cables: "BETHLEHEM, NEWYORK."

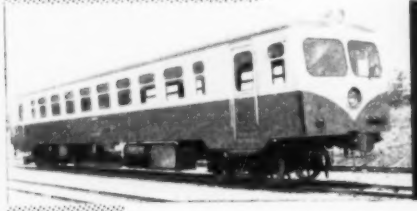
Bethlehem's great Sparrows Point plant in the Port of Baltimore, U.S.A., is the world's largest steel mill located on tidewater. Products for export can be loaded from this plant directly aboard ship.

BETHLEHEM STEEL

Represented in all principal cities of the world by offices and representatives of Bethlehem Steel Export Company.

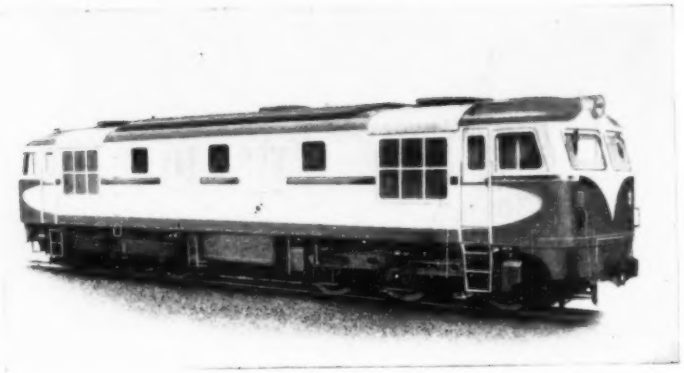
705B

Safety in Operation and An Extremely Long Life of Service!



HITACHI

LOCOMOTIVES



Shown here are some of the representative Hitachi Electric Locomotives; the one at the top is Diesel Hydraulic Car, and the one in the center, 42" gauge, 1,900 HP Diesel Electric Locomotive powered by a single MAN type V8 V22/30 mAuL Engine with a continuous output of 1,680 HP and rated output of 1,900 HP per hour. It can be used for hauling either freight or passenger trains, at a speed of 55 m.p.h. for a 500 ton train. Illustration at the bottom represents Type ED 441 direct system A.C. Electric Locomotive.

Hitachi, Ltd.
Tokyo Japan

Cable Address: "HITACHY" TOKYO

Towards Better Marketing Control

● **Ratio of costs to sales gives a yardstick for analysis. Look at the examples below.**

● **There is even a formula to help you measure advertising effectiveness.**

Marketing is a "never-never land" when it comes to analysing costs and measuring effectiveness. Questions like "How much should I spend on advertising?" or "How effective is our marketing?" constantly plague management men.

The questions remain—but progress is being made in finding some of the answers. This is the conclusion you reach after looking at two articles in American advertising trade journals.

All business expenditures can be related to something, remarks *Printers' Ink*. In the case of advertising, the obvious yardstick is the percentage ratio of advertising expense to sales. And the same is true of all other marketing costs.

Printers' Ink asked a group of company advertising managers to answer this question: What percentage of your sales is spent on marketing? There were nearly 100 comprehensive responses. There was wide agreement on the four major items that make up marketing: advertising, sales promotion, marketing research, and the sales staff. And while there is still some difference of opinion on the precise definition of "marketing cost as a percent of sales," the answers provide a worthwhile yardstick.

I. Who Spends the Most?

Consumer-goods advertisers invest an average of 3% of their annual sales in advertising; for industrial advertisers, it is 0.8%. But figures for different companies and industries vary widely. (For a list of ratios by industry, see MD, January, p37). Only 18% of the industrial companies invested over 2% of sales for advertising—although one company reported 10%; while over 71% of consumer-goods advertisers spent more than 2%, with a high of 30%.

Advertising media for consumer goods—television, radio, mass-circulation newspapers and magazines—are much more costly than media that concentrate on industrial buyers—mostly small circulation business papers and technical journals. A few manufacturers of industrial products use high-cost consumer media to advertise industrial products, for their own good reasons.

Advertising investments are usually much higher than expenditures for sales promotion. But a number of companies invested roughly the same in these marketing areas. Sales promotion is defined as "those sales activities that supplement both personal selling and advertising, coordinate them, and help to make them more effective." Consumer-goods producers spend much more in this area.

Industrial producers, on the other hand, spend much more on their sales force. Considering the relatively low cost of industrial advertising, *Printers' Ink* wonders why industrial salesmen are not given more support—by putting sales points across in advertising.

Of all the marketing costs, marketing research receives the least amount of sales income. Only six companies spend 1% of sales or over on market research.

II. Measuring Effectiveness

Such cost figures are valuable accounting yardsticks, but they leave the crucial question un-

HOW MUCH FOR MARKETING?

Marketing cost as % of sales

	Advertising	Sales Promotion	Marketing Research	Sales Force
Consumer Products (Individual companies)				
Toiletries	30.0%	4.0%	0.5%	10.0%
Cosmetics	22.0	2.0	1.0	10.0
Paint	10.0	2.0	0.5	15.0
Housewares	10.0	2.0	2.0	6.0
Beer	9.5	6.4	–	–
Food and Feed	8.1	3.2	0.2	6.1
Food	7.0	5.0	1.0	3.0
Soft Drinks	5.0	3.0	0.5	1.0
Packaged Grocery Products	4.8	0.7	0.2	1.2
Textiles	3.0	0.7	0.5	3.6
Hand Tools	2.5	0.9	0.8	7.1
Appliances	2.5	1.5	1.0	4.0
Building Materials	2.2	1.9	0.1	4.8
Heating and Air Conditioning	2.0	0.5	0.1	4.5
Photographic Equipment	1.3	0.7	0.1	3.0
Insurance	1.0	0.5	–	17.5
Industrial Products (Individual companies)				
Instrument	2.0	0.9	1.0	9.0
Metalworking Machinery	1.8	0.2	0.5	–
Industrial Machinery	1.0	2.0	–	7.0
Foundry and Machining	1.0	0.8	0.1	5.5
Automotive Parts	1.0	0.5	1.5	4.5
Building Materials	1.0	0.3	–	4.0
Petroleum	0.8	0.3	–	3.0
Hand Tools	0.5	0.2	0.1	2.4
Plate Steel Fabrication	0.4	0.5	–	0.5
Aircraft Accessories	0.1	–	–	9.3

– Data not given

answered: How effective is the advertising? The advertising budget—whether it is determined as a percentage of past sales or by a sales-goal approach—must still be allocated to specific media, markets.

Advertising men can fall back on their professional experience, on case histories and rules of thumb. But if scientists now studying the problem are right, the problem can be reduced to a clear-cut formula.

These men, working as an Operations Research team at Arthur D. Little Inc., a Cambridge, Massachusetts (U. S. A.) research firm, have developed a formula from experimental data collected from careful market research. They say they simply apply the "scientific method" to business problems.

"Our experience is limited to a few industries and we have not tested all the advertising media," the Little researchers told the advertising trade journal *Tide*. "It is our hope that as these studies progress and the volume of experimental data grows, it will be possible to refine the technique and increase its usefulness."

At this point, the reasoning and research findings behind the formula are more valuable than the equation itself. The mathematicians have done some hard thinking on how to get the most out of intensive campaigns using specific media, in a specific market.

Little's formula is based on three sales concepts—called the Sales Saturation Level, Advertising Response, Sales Decay Rate.

Sales Saturation Level

Assuming that market conditions remain constant, Little found that there is a practical limit to the effectiveness of a given type of promotion. For instance, Little test-advertised a product with once-a-week newspaper insertions for 13 months. Sales increased 30% in the first six months of the campaign, then the sales rate leveled off, though the campaign ran for another seven months. In this case, the 30% increase is the Saturation Level. Little concludes that the advertising intensity might have been lowered after the Saturation Level was reached, with a big saving in costs.

It is necessary, of course, to test as many types of media as possible to see which is the most effective in reaching the Saturation Level at the lowest cost.

Advertising Response

How many additional sales can you generate for each additional advertising dollar? The second dollar you spend on advertising does not generate as many sales as the first dollar. Suppose, for example, that $5,000 spent on advertising a product for one month generates $25,000 in additional sales. Suppose, again, that spending $10,000—instead of $5,000—generates $44,000 in additional sales.

Thus, by spending $5,000, each advertising dollar generates $5 in sales. By spending $10,000, each dollar generates $4.40.

The closer you approach the Saturation Level, the less effective each advertising dollar becomes. Little determines the Advertising

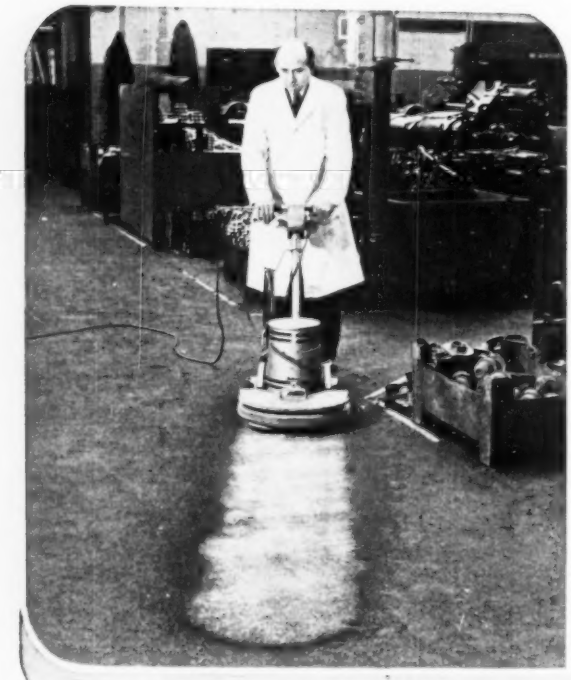


Photo by courtesy of Messrs. Rubery Owen & Co. Ltd.

The BITTERN

3-Brush Scarifying machine in action removing *impacted* grease from a factory floor

THE BITTERN SCARIFYING MACHINE

Designed & Manufactured by

Cimex-Fraser Tuson Ltd.

22/28 CRAY AVENUE · ORPINGTON · KENT

Response at the same time it finds the Saturation Level—with market tests.

Sales Decay Rate

What happens to sales if all advertising is stopped?

Little's researchers also found that, assuming constant market conditions, sales will decline at a constant rate each year—the more established the product, the slower the decline. And if intensive promotion is stopped completely, sales will revert sooner or later to the normal decay rate.

This Decay Rate is measured as a percentage change each year. But to use it in an equation, the mathematicians change the percentage into a constant by using a semi-logarithmic table.

Little used continuing market tests to calculate the Decay Rate for six products using specific media in specific markets—radio and television ("spot" or brief announcements of a minute or half-minute duration) newspapers, direct mail, etc.

With these three components, Little's operations research men say they can calculate the increase in the rate of sales an advertiser can expect in a given period.

The formula looks like this:

$$ds/dt = rA[1-S)/1] - cS$$

This equation expresses this concept: that the increase in the rate of sales for a given period (ds/dt) is proportional to:

r—the Advertising Response
A—the intensity of the advertising effort
1—Saturation Level
S—current sales
c—Sales Decay Rate

(1–S/1—the fraction of potential sales that it is possible to get. In other words, subtract current sales from the Saturation Level, then divide this figure by the Saturation Level to get the fraction.

cS—the Sales Decay Rate times current sales takes into consideration the sales that would be lost without advertising. It takes this much advertising effort to maintain sales at the current level. (*Printers' Ink*, *Feb*1, *p*53; *Tide*, *Jan* 25, *p*22) ●

Print your weights on a New TOLEDO®

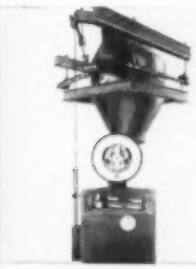
save time and money

Printed Weights—Eliminate errors in reading, remembering and recording weights—get fast, accurate *printed* weights with Toledo Printweigh. Choice of ticket, sheet or strip tape records. Available on Toledo dial type scales of all capacities.

Modern Motor Truck Scales—Weigh on Toledo Hi-Weigh Truck Scales and *know* your load! Engineered for long-life accuracy. Capacities to 60 tons, platforms to 60 ft.

Counting—Use Toledo Counting Scales to count hundreds of parts *accurately* in a few seconds! Complete line choice of double and triple ratio.

Built-In Scales — For in-plant weighing of loads on factory trucks. Capacities to 10 tons; platforms to 9′ x 7′.

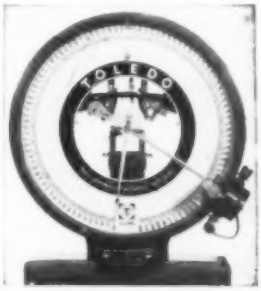


Hopper Scales — Full range of capacities for hopper or tank loads. Overhead suspension or floor mounted styles.

Track Scales — Weigh commodities handled on monorails or overhead tracks. Many types and capacities.

ON YOUR SCALES MATERIALS BECOME MONEY

Good weighing is a fundamental of good cost control; basic accounting records of materials received, shipped or transferred start at the scale. In Toledo's complete line there is a modern answer to every problem of industrial weighing . . . to help you speed your material handling and prevent weighing losses. Write for new condensed catalog No. 2001.



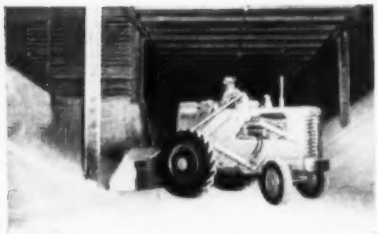
Automatic Cut-Offs—Both mercury and photo-electric controls are available for simple filling operation or complex batching system.

TOLEDO SCALE COMPANY

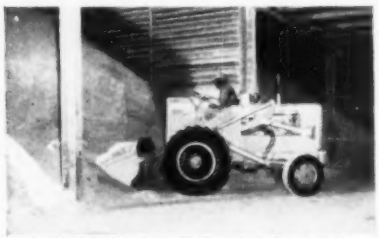
TOLEDO 1, OHIO, U.S.A.

BIG LOADER MANEUVERS LIKE SMALL LOADER

in chemical and fertilizer plant



NO LOST TIME JOCKEYING AROUND with TL-10 TRACTO-LOADER. Operator makes right angle turns. In fact, he can turn from a nine-foot aisle into a ten-foot bin! Made possible by bucket-over-drive-wheels design. Means better traction and easier steering, too!



NO RUNNING ROOM NEEDED TO LOAD — Instead of ramming or butting, operator just eases the 0.76m³ (1-cu yd) bucket into material. The hydraulic torque converter drive and scooping action of tip-back bucket quickly, smoothly crowd in a heaping load.

NO LOST TIME DELIVERING LOAD — Operator just pulls a lever and he backs from the pile "on the double." He gets into travel position easily, quickly with power steering and short, 3.35m (11-foot) turning radius. Tip-back bucket enables him to carry load low, close to cowl.

• • •

Let your Allis-Chalmers construction machinery dealer show you the TL-10's maneuvering and load-getting advantages. Send for free catalog.

TRACTOMOTIVE
TRACTOMOTIVE CORPORATION
Export Dept., MD, Deerfield, Ill., U. S. A.

▶ FINANCIAL DIGEST

Mutual funds are beginning to spring up in Latin America. If they become popular, they may help provide a tonic for the area's generally weak markets for industrial shares. And they could open new financial vistas for expansion-minded businessmen.

Latin American investors have a traditional suspicion of equity shares—of entrusting their money to a corporate "steward." The mutual funds may be one way of overcoming that suspicion.

Mutual funds are essentially holding companies that sell their own stock, and invest the proceeds in productive business enterprises. They have several advantages:

—They pool many individuals' small investments into one large, flexible fund.

—They are in a much better position to evaluate financial data and investment opportunities.

—They can better diversify their investments, give the investor some protection against trouble in one industry.

One of the most ambitious mutual funds is opening in Brazil. It is a joint venture of the International Basic Economy Corp., of the U.S.A. and several well-known Brazilian banks.

IBEC officials say the fund will invest most of its capital in local projects, and allow the small investor to share in the great expansion of the Brazilian economy in a "reasonable, safe way." The fund's portfolio will contain mostly top-grade Brazilian industrial and commercial stocks, but IBEC experts will have a sharp eye out for promising new ventures in mining, agriculture, power. One feature: The fund will contain several "blue-chip" (high grade) investments listed on the New York Stock Exchange.

The biggest problem for the fund managers will be to keep ahead of Brazil's constant inflation—running at an estimated 18% to 21% yearly.

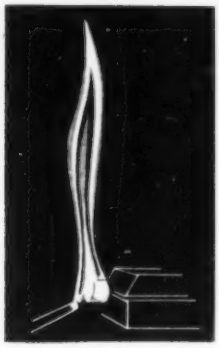
To convince the "doubting Tomas" that this can be done, IBEC drew up charts to show how the stocks of 10 leading Brazilian companies have done. An investment of 100 cruzeiros in these companies, made in 1950, would now be worth 525 cruzeiros (not including reinvested dividends, but including some selling for capital gains). This compares with a rise from 100 cruzeiros to just 226 if the money had been "invested" in U. S. dollars.

Mexico is displaying more interest in mutual funds as well. An example is the Banco Nacional de Mexico's Sociedad General de Inversiones, maintaining holdings in a diversified list of Mexican enterprises—textiles, aviation, insurance, mining, banking.

Cuba has a new fund with a double purpose: to attract U. S. as well as local capital. The Latin American Mutual Fund hopes to encourage development of the Havana securities market, provide equity capital for growth companies.

•

In Africa—"South of the Sahara:" Note the first employee share-purchase plan that includes native African workers. Rhodesian Selection Trust, the giant copper mining organization, will encourage workers to buy company stock by adding 50% to their investments.



NEW WAY to generate 7,000°C. to 10,000°C. flashes an electric arc between two electrodes.

HIGH TEMPERATURE turns many difficult-to-melt materials into vapor.

High-Intensity Arc Gets Ready for Industrial Use

Digested from CHEMICAL WEEK, Mar 9, p26; CHEMICAL ENGINEERING, Mar p237

The unique properties of the high-intensity electric arc—so far used commercially only as a source of illumination for searchlights and motion picture projectors—are about to be used in commercial processing. One of the first applications will be in Vitro Corp. of America's (West Orange, N. J., U.S.A.) process for separating manganese from low-grade rhodonite ore, up to now a difficult, costly job.

Electrothermal processes, of course, are no newcomers to the process industries. They have long been employed for commercial production of such materials as calcium carbide and cyanamide, phosphorous and phosphoric acid and high-grade steels. Arcs used in these processes operate in the low-intensity range, seldom exceeding 3,600°C.

I. Excess Current Makes Heat

The high-intensity arc, on the other hand, occurs when the electrical input to the arc exceeds the initial current density—the maximum amount of energy that can be dissipated at the anode tip by radiation and conduction alone. As this excess energy further increases,

—any material which makes up the anode is rapidly vaporized.

—molecules of vaporized material are decomposed to atoms, many of which are then ionized.

—temperature of the vapor jet rises rapidly to between 7,000°C. and 10,000°C. in the vicinity of the anode.

—the vapor jet is projected at high velocity (about 160 kilometers per hour) into the surrounding atmosphere where reactions of vaporized refractories become possible. Ordinary methods strain to melt refractories; the high-intensity arc easily vaporizes them.

Vitro Corp.'s process for recovering manganese gives you an idea of how the high-intensity arc can be used commercially. Not a process in itself, the high-intensity arc is rather a unique tool for producing ultra-high temperatures. Vitro Corp.'s research department describes it as a means of very efficiently transferring the heat generated by electrical energy to other materials.

The company has set up pilot plant to study the feasibility of large-scale recovering of manganese from rhodonite—using the high-intensity arc. Though rhodonite contains a large percentage of manganese, it does not lend itself to conventional processing.

Vitro Corp.'s first step is to treat and crush the rhodonite ore. It is then combined with carbon and fabricated into a consumable anode to be fed into the arc.

Unlike carbon electrodes employed in conventional, low-intensity arc furnaces, anodes for the high-intensity arc must contain a high proportion of nonconductive material. If the ore-to-carbon ratio is too low, power is wasted in vaporizing carbon; if it is too high, losses caused by high resistance in the anode limit the arc's efficiency. Vitro Corp. achieves optimum operation with a minimum carbon content (15% to 25%) and a power consumption of about 6 kilowatts per kilogram of ore decomposed.

Chemical breakdown of the refractory manganese ore occurs in the flame just beyond the tip of the anode. In the intense heat of the arc, the ore vaporizes and breaks down into atoms and ions of manganese, silicon, and oxygen.

As the vapor moves away from the anode crater (where the temperature is between 7,000°C. and 10,000°C.) into the cooler portion of the arc tail flame (2,000°C.), the elements recombine into simple oxides, mostly of manganese and silicon. Rapid cooling causes the vapors to condense into a fine dust of submicron-size particles. After the finely powdered material has been cooled and collected in a filter, it is ready for processing by conventional means.

While Vitro Corp. feels it has a commercial process, others are still experimenting. For instance, Light Metals Refining Corp. (U.S.A.) produces beryllium chloride by flashing an 11,000°C. arc between electrodes of carbon and beryllium ore in an atmosphere of chlorine.

II. Some Possibilities

This same process has a number of possibilities. It can produce other metallic chlorides by the use of a chlorine atmosphere, and it can reduce carbon compounds in an inert atmosphere. Another process might employ the high-intensity arc in a liquid hydrocarbon to form hydrogen and acetylene.

In these applications and others, the high-intensity arc may open up a whole new range of chemical processes, perhaps even provide chemicals that would otherwise be too costly to make. ●

Instead of a fixed plant . . .

. . . a modern plant packed in trucks moves on wheels . . .

Mobile Plant Follows its Raw

Digested from FACTORY MANAGEMENT & MAINTENANCE, Mar, p92

If the cost of transporting raw materials to your plant is rising, and cutting too deeply into profits, consider this: Put your factory on wheels and you can roll it right to the materials source.

The idea has paid immense dividends for Peter J. Schweitzer, Inc. (Windom, Minn., U.S.A.). Savings on freight alone in the first year was one-and-one half times the entire cost of the new plant—including all its specially-designed equipment.

To be sure, Schweitzer is in a highly-specialized industry — decorticating flax straw. About 70% by volume of the flax is waste. From the other 30% Schweitzer makes cigarette paper.

The company depends on widely varied local crops. In the past, flax had to be shipped from all over a 587,000 square-kilometer-area to one of two processing plants in Windom or Breckenridge, Minn.

Schweitzer may have an unusual solution to its transportation problem. But the problem itself is familiar to management. The processor of frozen juice concentrate or dry milk solids faces the same situation.

Before Schweitzer built its new mobile plant, it required 8000 freight cars yearly to transport the flax as much as 640 kilometers from some 35 scattered locations to processing. Now, one-third of that total is processed at the point where it is grown—in a factory that can be set up in 5 hours, taken apart in 5 hours, and moved over the road with its 13 auxiliary vehicles (power unit, disposal trucks, fork-lift tractor, fire trucks, etc.)

Here's how the plant operates: The entire caravan moves into a field where straw has been stacked to await processing. A tractor with fork attachment deposits bales of straw next to a belt conveyor, which carries it through decorticating. Then an auger-type conveyor takes waste to trucks for disposal.

Decorticated straw (called tow) feeds into a two-stage baler. The bales travel, via a roller conveyor with a built-in scale, to a flat-bed trailer. Here a worker stacks the bales with the help of an electric crane. The trailer takes the tow to the nearest railroad siding, where a fork-lift truck loads six-bale units into railroad cars.

Power comes from a diesel-driven electric generator mounted on a trailer. Other services provided:

—**A workshop trailer,** fully equipped that serves as a maintenance shop.

—**Two fire trucks.** Many dry-type extinguishers are located in and near the plant.

—**Infra-red interior heating** while the plant is operating; propane-gas heating during idle heating periods.

—**A self-cleaning dust filter** to clean the air in working areas.

—**An air compressor** to supply the oil-mist lubricating system and other air-operated devices.

—**An electrically operated cooler** to supply drinking water.

—**Direct-type incandescent luminaires.**

Most of the plant's machinery was designed by Schweitzer and built in its own shops. Light-

Venezuela: A Generator

Small towns and villages in Venezuela grow so fast that they sometimes outdistance their supply of electricity. Mobile generating plants, like the one above, move from community to community, supplying power wherever it is needed.

. . . to its raw materials.

Materials

weight, all-aluminum machinery kept weight within the legal limits for over-the-highway travel. Other "plant construction" details contribute to both easy maintenance and good working conditions: (1) the processing trailer has 7.6 centimeters of uncompacted glass-fiber insulation that deadens noise and provides a thermal barrier, (2) interior is finished with an acoustic tile ceiling and varnished, wood-paneled walls. ●

That Travels Anywhere

Built by the White Motor Co. (Springfield, Ohio, U.S.A.), the plants can withstand off-the-highway transportation strains. They are completely self-contained, and are designed with easy operation and maintenance in mind. (*Product Engineering, Mar, p*158)

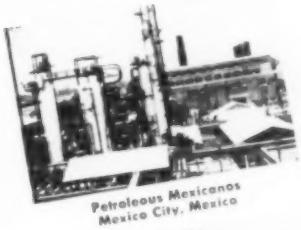
Damodar Valley Corporation
Bokaro, India

La Electricidad de Maracay
Maracay, Venezuela

Societe Termo-Elettrica Siciliana
Palermo, Sicily

C. A. Electricidad de Caracas
Caracas, Venezuela

Compania de Acero del Pacifico
Concepcion, Chile


Petroleous Mexicanos
Mexico City, Mexico

Florida Power Corporation
Booth Point, Florida

PROJECTS IN POWER

—THE WORLD OVER

Kuljian power engineers have designed, engineered and supervised construction of more than eighty power plants throughout the world . . . representing a total electric generating capacity of well over two and one-half million kilowatts . . . a total investment in excess of one-half billion dollars.

Kuljian power projects for utilities and industry have ranged in scope from site location studies, economic surveys and load forecasts . . . to design, procurement, construction supervision, and initial operation of complete power systems.

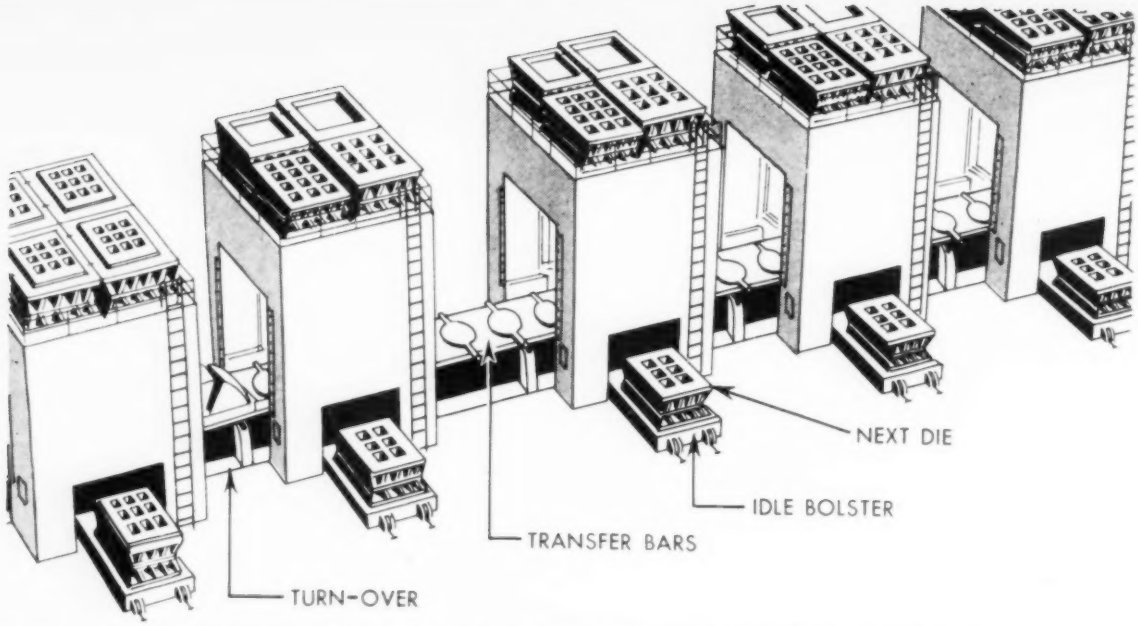
Whatever your program calls for . . . a steam or hydro power plant, transmission lines, distribution systems, water resource development, or the expansion and modernization of industrial power facilities . . . Kuljian offers *every* service to meet your needs.

The **Kuljian** *Corporation*

engineers • constructors

1200 North Broad Street • Philadelphia 21, Penna., U.S.A.

BRANCH OFFICES THROUGHOUT THE WORLD



Tomorrow's press line may look like this—for both high-volume and low-volume stamping companies.

New Concepts for Press Automation

Digested from AMERICAN MACHINIST, Mar 11, p113

There's at least one big gap in the steady progress of automation: How do you automate sheet-metal presses?

What is needed to bring press-line automation closer to reality is more versatile and simpler equipment. This is especially true for smaller, low-volume shops. There are signs that the press-building industry is working along just those lines. Clearing Machine Corp. (Chicago, Ill., U.S.A.), is one company that has designed and built relatively simple equipment for handling stampings between its presses.

Clearing feels that transfer presses hold some of the answers. They can perform many operations on a stamping, and produce a completed part within one press. The part moves from station to station by a feed mechanism driven by the press itself.

But today's transfer presses do have drawbacks. They have been limited to parts with a flat flange or edge, and the fixed stations could not be changed or adapted to larger dies. For example: Presses bought several years ago for automobile air cleaners are now obsolete (but not worn out) because designers of ever-lower hoods now demand a flat, large diameter air cleaner.

Clearing's present concept of press automation is to treat a line of presses as one big transfer press. Thus the company hopes to achieve simplicity and versatility. In this setup the transfer mechanism is continuous from press to press. An integrated feed mechanism, basically simple and adjustable to meet changing product requirements, passes the work through the line of presses. An automated auxiliary operation (a hole puncher, for instance) can easily be dropped into the line.

Clearing's transfer mechanism consists of two channels and drive tubes. These elements are sectional to facilitate changeovers. "Fingers" attached to each channel and moved by the tubes handle parts through the press.

The basic concept of a transfer press has been extended in still another direction—modular press design. Upright presses of modular design cope with product changes like that of the air cleaner. They permit an additional unit to be added to an existing press, and the feed tubes can be extended. The result is a new composite and integral press ready to produce a different part.

Die changes, too, can be speeded up. Two die-support structures (bolsters) are used at each press. The die for the next product-run can be set up on the idle bolster while the other is in the press. When the first run is completed, the bolster assembly is power driven through the press uprights. The new die is set in the press and the old one carried out to an unloading position. This change can be made in less than 30 minutes.

A small-run stamping company utilizing both power-driven die-setting principle and transfer automation can economically make product changes every 4 to 8 hours.

Even in high-volume plants a press line does not always run continuously on the same part. Some of the lines do; others may run for a day or a week on one item, and then be changed to another job. Time saved on the changeover operations in effect adds to plant capacity. ●

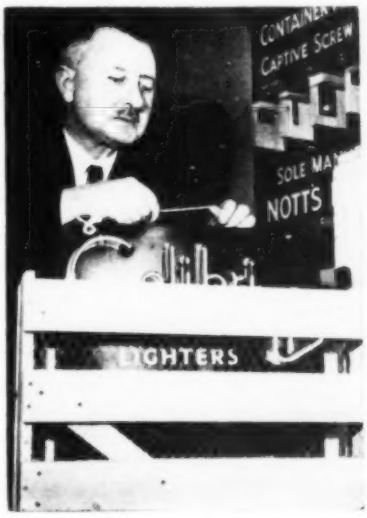
Looking Ahead in Technology

● **GAS-LUBRICATED BEARINGS are beginning to find practical uses in industry.** In this bearing, the shaft rides on a film of gas separating it from the bearing surface. Advantages include: (1) no contamination from lubricant, (2) lowest friction of any type bearing, (3) no operating temperature limitations. They are not yet commercially available, but possibilities exist in the chemical, textile, nuclear, instrumentation, aircraft, and machine tool fields. (*Chemical Engineering, Mar, p* 144)

● **CERAMIC HONEYCOMB, complete with ceramic skins and able to withstand 1100°C. in repeated heats,** is in the experimental stage at Continental Can Co. (U.S.A.). Strength of the ceramic material is about 28,000 kilograms per square centimeter. The completed "sandwich" will take 2,100 kg. per sq. cm. in compression . . . **Routing—instead of milling**—72,000-kilogram tensile strength steel is being tried successfully in England. Pocketing and rough profiling are done with a 3.8 centimeter diameter cutter tipped with titanium carbide, running at 6000 revolutions per minute and cooled by carbon dioxide. Operation is done in 15 minutes, compared to 60 minutes for milling. (*American Machinist, Feb* 25, *p*105)

● **NEW PROCESS permits conversion of fishmeal into flour.** Treated fishmeal might well become a common source of proteins throughout the world. The process de-fats and deodorizes either fresh fish or dehydrated fishmeal. The meal can be converted into an almost tasteless and odorless white flour, containing 70% to 80% protein. Only small amounts are needed to supplement bread and other cereal products. Children's diets can be effectively supplemented with fish flour at a cost of only one-fourth of a cent per day. (*American Letter, Mar* 16)

● **ARTIFICIAL 7.6-centimeter mica crystals have been produced experimentally** by Japan's Tokyo Shibaura Electric Co. The crystals can be used in electron tubes and other equipment subjected to high temperatures. The company claims the crystals can endure temperatures of more than 1,000°C. . . . **A "transistorized" electric livestock fence** unit of German design cuts battery costs. Two transistors charge two capacitors through a high-voltage transformer. When a bull nuzzles the fence wire he gets a 5,000-volt pulse through his nose—with no damage except to his *amour-propre*. (*Electronics, Mar* 10, *pp*21, 42)



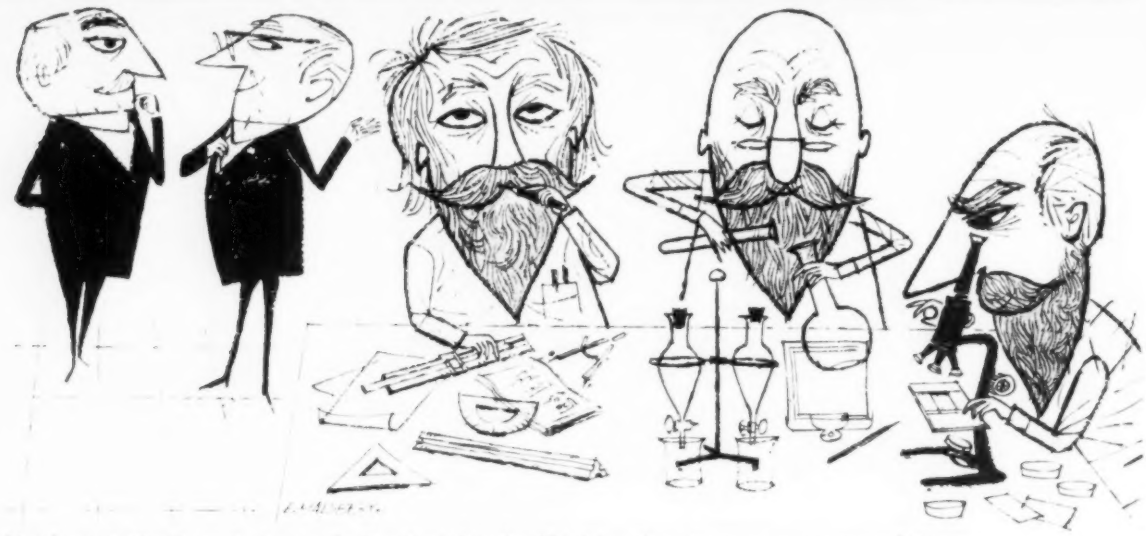
● **PACKAGING of glass goods so that handlers may see that they are fragile** is one precaution against breakage in transit. It is a technique that might profit many shippers. T. F. Dingwall Ltd. (London, England) recently exhibited this "open" method of packaging neon signs (above) and contends that longshoremen and porters will now handle these products more gently. (*Chemical Week, Mar* 16, *p*59)

● **ATOMIZED suspension processing technique is about to get its first trial** in a unit built in Scotland by George Scott & Son, Ltd. Installation will process waste liquor from a soda-pulping operation. Developed by the Pulp & Paper Research Institute of Canada, the technique involves pressure-spraying solutions or slurries into the top of a tower, then heating the atomized particles by radiation from hot (about 620°C.) tower walls. With no vapor present except from the heated material, there is no air film around each particle—and heat transfer is rapid. (*Chemical Engineering, Feb, p*139)

● **GAS-TURBINE ENGINES will be offered as an option within 2 years,** according to one American automobile industry official. Other sources say just as strongly that the free-piston engine and today's reciprocating engine are still very much in the race to become the "engine of tomorrow." But note these signs: Chrysler has substantially expanded its research facilities to permit more extensive auto turbine work; Chevrolet and Ford are both experimenting with turbines in trucks. A Ford official says the turbine will be introduced in trucks before it is introduced in automobiles. (*National Petroleum News, Mar, p*85)

● **BACTERIA may reduce sulfates to yield hydrogen sulfide** in a new British process. The bacteria would come from sewage sludge and the hydrogen sulfide would be used to produce sulfur or sulfuric acid. The London County Council is now operating a small unit at its sewage works at Beckton, and engineers are considering plans for a pilot operation. They estimate that all the sludge in Britain could yield 100,000 tons of sulfur annually. (*Times Review of Industry, Feb, p*22)

● **MILLED PEAT will fuel Ireland's "cheap fuel" project at Ferbane.** A year's supply has been dug from adjacent bogs, and the plant will be given preliminary tests shortly. (*Electrical World, Mar* 8, *p*22)



Not just similar beards, but a similar "need to be liked" makes these men a successful team.

Picking Groups to Work Together

Compatible groups produce more, says an expert who claims he can pick the winning teams.

Digested from BUSINESS WEEK, March 23, p115

In jobs involving close relationships—such as committees and research groups — management wants to be sure it is getting the best possible performance out of a team.

That is why Harvard University (U.S.A.) psychologist Dr. William C. Schultz has aroused a flurry of interest by coming up with what seems to be an objective way to pick combinations of people. It is built around a simple questionnaire that gives a three-way measure of personality. Schultz claims his method will predict, in advance, which groups will get together to produce results, and which groups will not.

He has verified his studies on a number of experimental groups—college students and U.S. Navy men. And the potential significance of this "test of compatibility" has not been lost on industry. A number of companies are considering industrial schemes under the Schultz test.

Here is the basic problem: Do you pick a team by balancing out opposites, with characteristics that complement each other? Or do you select a group of people more or less alike? And if it is the latter, what kind of likeness do you look for?

Schultz says the "birds of a feather" approach is best. And he says the essential point of compatibility is a similar "need to be liked." The psychologist has found what he calls three "interpersonal needs" that determine whether or not a group will get along:

Affection — "the individual's need to be liked, his inclination to be genuinely friendly, overfriendly, or unfriendly."

Independence—"strength of desire for rule or authority."

Inclusion—"the degree to which he feels that other people are interested in him."

"To agree, to offer support, to mediate disagreements, to crack a joke—these may be ways for a group member to seek liking," says Schultz.

Independence can be demonstrated by disagreeing continuously, making counterproposals, citing past experience.

"Inclusion" is often marked by being boisterous, making startling comments or threats, or withdrawing.

Though these qualities are likely to be irrelevant to the actual job at hand, they have a lot to do with getting the job done.

All three are important and interrelated, but it is "affection" and the "need to be liked," Schultz finds, that plays the key role in group compatibility.

Schultz' test gives a measure of what he calls a person's "interpersonal relations orientation." The key point, need-to-be-liked, is rated on a scale.

Once rated, personality types are divided into three basic groupings:

Counterpersonal — This person really doesn't like working closely with others. He may be superficially friendly, but he may give everyone the "cold shoulder."

Overpersonal — This person wants above all to be liked. He may fawn on people, try continually to gain approval. He may jealously guard his friendships, act possessive.

Personal—He is in the middle ground—relaxed in his relations with others, "comfortable" and "discriminating" in his personal relations.

To set up the most compatible groups, Dr. Schultz usually combines "personal" and "overpersonal" types. But, to prove his theory, he has set up compatible groups entirely of "counterpersonal" types. Incompatible groups are formed by combining either "personal" or "overpersonal" people with "counterpersonals."

In addition, Schultz provided each group of five people in his experiments with a "focal person"—a person to set the group atmosphere and serve as a sort of leader. His rating on the scale in relation to the others predicted this role. Each group was also given a "main supporting member," and the other three were just plain compatible members.

In a series of games in which a quick decision under pressure was essential, Schultz' compatible groups defeated the incompatibles 86% of the time. And ability was equally divided.

The groups were asked to solve logical puzzles, and to build a toy with parts and a diagram provided. Another task was a kind of chess game, in which the pieces represented airplanes: One group's planes defend an aircraft carrier from the other's attack.

This is what slowed down the incompatible teams: They could not agree on the way group decisions should be made. Instead, sources of friction were set up. Counterpersonal members concentrated on what was suggested, and ignored the person making the suggestion. Overpersonal members paid more attention to who made the suggestions and how they were treated. The conflicting members were unable to find a way to resolve differences.

In cases like this, says Schultz, "the result is open conflict. The members lose all desire and ability to work together. Or the group may try to gloss over its difficulties—a more usual pattern with intellectual groups. It takes a lot of energy to avoid an area of conflict, and the group has little left for its job."

But in a compatible group, members feel more nearly the same toward working together, and can more easily agree on how to make decisions. And that is what produces results. ●

Retirement: Parkinson Has a New Approach

Digested from THE ECONOMIST, Feb 16, p535; Feb 23, p 622

In these days of profit-sharing plans, liberal retirement benefits and group insurance, one question arises to disturb management's concept of the modern way to do business. The question: At what age should a man retire?

Usually the retirement age is fixed at 65. But experience shows that the successors of the man who retires have found that his mental powers and energy show signs of flagging by 62.

Surprisingly, should the retirement age be 60, people will begin to lose their grip at 57. An executive retiring at 55 will have seen his best days by the time he reaches 52. Apparently efficiency declines at the retirement age (R) minus 3, no matter what age R has been fixed at. But what is the "R-age?"

Parkinson (see below) suggests an approach based on this key fact: The age of retirement should not be related in any way to the man whose retirement is being considered. It is his successor that must be watched.

Studies showed that a business man will pass through several stages in a successful career, ranging from the age of qualification (Q) through the age of achievement (AA, or Q plus 25 years), to the age of obstruction (OO, equal to Q plus 50 years).

At age Q, the businessman has been exposed to an elaborate training that has proved profitable only to those paid for organizing it. He is ready to begin his career.

But the problem centers not on the retiring businessman (X) but on Y, his successor. How are the ages of X and Y likely to compare? Parkinson's research proves that the age gap between X and Y is 15 years.

Y also goes through the same stages as X. Assuming that the age of qualification (Q) for Y is 22, Y will have reached the age of achievement (AA) at 47, when X is 62.

This is where the crisis occurs.

If Y's ambitions are thwarted by X retaining control, Y enters a different series of stages beginning with the age of frustration and ending with the age of oblivion. During these stages, Y becomes unfit as a successor to X.

Should Y recognize his predicament, his problem becomes one of making X retire at the age of 60, while still able to do the work better than anyone else. Y, of course, is just short of the age of achievement. He has ample time to plan his campaign before he becomes frustrated.

Y's task is not easy. The more outstanding X has proved to be, and the longer he has held office, the more hopeless is the task of replacing him.

So Y must seize the initiative. Unless X goes in good time, the whole organization will suffer. But how is he to be moved? Fortunately, there is a practical method of getting rid of the boss.

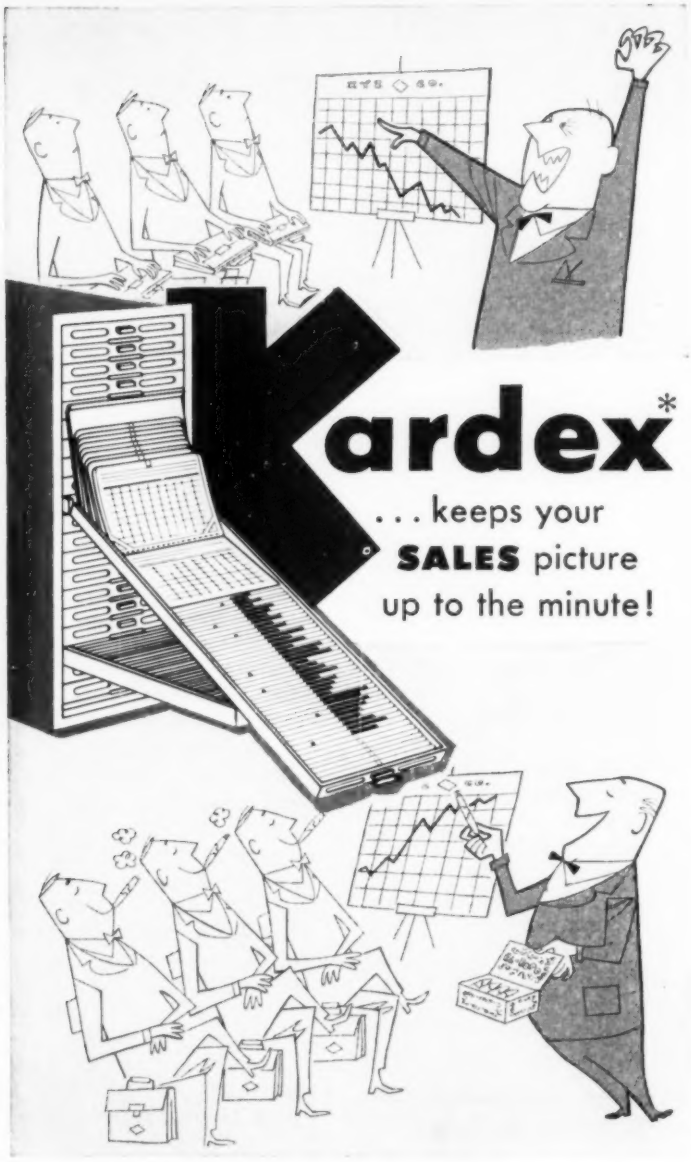
The method depends on air travel and the filling in of forms.

The first step in this technique is to plan a program for the great man. For instance, he could attend a conference at Helsinki in June, a congress at Adelaide in July, and a convention at Ottawa in August. He is assured that his

Meet Parkinson

Readers of The Economist, London, were introduced two years ago to some fresh thinking—and decidedly new approaches—to management problems. The discoverer of these techniques is called "Parkinson." Since his first appearance, Parkinson has applied his unique talents to subjects ranging from bureaucracy in the Admiralty to the retirement age problem considered here.

Let the reader beware: While Parkinson may seem to write in jest, his revelations do not always fall wide of the mark.—The Editors



MANAGEMENT BY KARDEX VISIBLE CONTROL charts sales automatically—by Account, Dealer or product classification . . . compares quotas with actual sales . . . shows when the last call was made and when the next is due. No more rummaging for facts and figures . . . no more hit-or-miss selling! With Kardex you know at a glance where to look for your next sale.

There are 18,000 Remington Rand Branches and Distributors throughout the world—see your telephone directory for your local representative.

*Only Remington Rand makes **KARDEX***

Remington Rand International

DIVISION OF SPERRY RAND CORPORATION

presence at these meetings is essential. The travel program will allow his return to the office for three days between conferences.

You will notice that the conferences are held at places at a maximum distance apart. And the executive must travel by air all the way. There must be no possibility of a restful sea voyage.

Most of the flight time, of course, will be spent in filling in various forms. But form-filling can be made a separate ordeal. Here are some samples:

A favorite gambit is worded:

Return rendered in respect of the month of	

What does it mean? Only the sender knows.

An ambiguity expert working with a space consultant could turn out something like this:

Cross out the word which does not apply	Full Name	Address	Domicile	When Naturalised and why	Status
Mr. Mrs. Miss					

Such a form is specially designed for someone with a many-forked name and address. "Domicile" is meaningless and after that is a mysterious reference to naturalisation. Lastly, "status" leaves the filler-in with a bewildering choice of meanings.

Now a specialist in irrelevance takes over. His contribution:

Number of Your Identity Card or Passport	Your Grandfather's full name	Your Grandmother's maiden name	Have you been vaccinated, inoculated, when and why?	Give full details

Note: *The penalty for furnishing incorrect information may be a fine of £5,000 or a year's penal servitude or quite possibly both.*

Experiments show that sufficient air travel and sufficient forms will soon force elderly men in responsible positions to retire. But a serious problem remains.

What does the successor do when he nears the retirement age he has fixed for others? Is he to fall prey to his own technique? Of course not! When he is approached with the details of a series of conferences around the world, he need only wave them aside with the observation: "Conferences are a waste of time." Besides, he is planning a two-month vacation. And while he is away he expects the forms to be filled out. His successors will have to find some other method of forcing his retirement. ●

Harvard's Professor Malcolm McNair (right) agrees that more awareness of human relations in business is needed. But, he asks below . . .

Is It Really a "Skill"?

Digested from HARVARD BUSINESS REVIEW, March-April, p15

One of America's most distinguished business educators recently observed: "As we have learned more and more about a business organization as a social unit, we have become increasingly certain that the executive's skill with people—or the lack of it—is the determining element in his long-range success or failure."

Here we are down to the nub of the matter. What is this skill? Can it be taught? Are there dangers in the teaching of it?

I am essentially disturbed at the combination of **skill** with human relations. For me, "human relations skill" has a cold-blooded connotation of proficiency, technical expertness, calculated effect.

In my view, awareness of human relations and the conscious effort to practice human relations on other people are two different things, and I think this is crucial.

As soon as a man consciously undertakes to practice human relations, one of several bad consequences is almost inevitable. Consciously trying to practice human relations is like consciously trying to be a gentleman. If you have to think about it, insincerity creeps in, personal integrity moves out.

A less deliberate but perhaps even more dangerous consequence may be the development of a desire for managing other people's lives—always, of course, with the most excellent intentions. In the same direction the conscious practice of human relations leads to amateur psychiatry and to the unwarranted invasion of privacy.

Hence I am disturbed about the consequences to business management of human relations blown up into a pseudo-science—with a special vocabulary and with special practitioners and experts.

It was almost inevitable that people would run away with such a fruitful concept, and set it up as an idol with appropriate rituals of worship (called "techniques").

Apparently this "skill" of the "human relations practitioner" consists to a considerable degree of what is called "listening." The basic importance of the ability to listen is not to be gainsaid; neither is it to be denied that people do not always reveal their inward feelings in words. But in the effort to blow human relations up into a science and develop a technique of communication, some of the enthusiasts have worked up such standard conversational gambits as: "This is what I think I hear you saying," or "As I listen, this is what I think you mean."

No doubt there are times when a silent reaction of this kind is appropriate, but if the human relations practitioner makes such phrases part of his conversational repertoire, there are times when these cute remarks may gain him a punch in the nose. Sometimes people forcefully mean what they are saying and will rightly regard anything less than a man-to-man recognition of that fact as derogatory to their dignity.

One group of foremen who were given a course emphasizing human relations thereafter turned out to be distinctly poorer practitioners than they had been before taking the course. This was not, to my mind, simply an accident. I think it might well be expected nine times out of ten. In other words, the overemphasis on human relations—with all its apparatus of courses, special vocabulary, and so on—tends to create the very problems that human relations deals with. It is a vicious circle. You encourage people to pick at the scabs of their psychic wounds.

In evaluating the place of human relations in business, a recent incident is in point:

At a luncheon gathering Miss Else Herzberg, the highly successful educational director of Marks & Spencer, Ltd., a large chain of stores in Britain, described at some length the personnel management policies of that concern and the high state of employee morale that existed. Throughout her description I was listening for some reference to human relations. I did not hear it, and when she had finished I said, "But, Miss Herzberg, you haven't said anything about human relations." Immediately she flashed back, "We live it; we don't have to talk about it."

And so, although I concede that there is still too little awareness of human relations problems in many business organizations, I think that the present vogue for human relations, and for executive development programs which strongly emphasize human relations, holds some real dangers. It weakens the sense of responsibility. It promotes conformity, and too greatly subordinates the development of individuals.

Good human relations do not lend themselves to dissection with a scalpel. How do people normally acquire good human relations? Some of course never do. In the case of those who are successful in human relations and at the same time retain their sincerity, the result, I am convinced, is a composite product of breeding, home, church, education, and experience generally, not of formal Human Relations courses. ●

Small orders increase the cost of ordering. Big orders increase inventory costs. Is there a happy medium? One U.S. manufacturer found . . .

Savings When You Buy

Digested from THE CONTROLLER, Mar, p111

How much to buy, how often to buy it? Chances are this question will plague management forever. The only hope is that methods will be developed to make what is always a gamble just a little less risky.

Indeed, there has been a good deal of progress in making inventory decisions easier. Management is turning to electronic accounting machines, and it is setting researchers to work finding out more about the economics of purchasing.

American Machine & Foundry Co. (New York), is one manufacturer who has simplified his inventory decision-making. The chart (right), worked up by AMF's research department, serves as a guide to buying.

The researchers started with these facts: Buying too much can be as uneconomical as buying too little. Frequent ordering of small amounts keeps down the cost of maintaining inventory. But it also increases unit price costs and the administrative expenses.

Infrequent orders for large amounts often offers quantity discounts, and cuts the ordering expense. But the cost of inventory upkeep often outweighs these advantages.

Where is the middle ground? AMF decided to figure out the optimum quantity to buy of its standard inventory materials, based on dollar value of monthly requirements, coordinated with the dollar value per order.

The company's research department determined the average cost of a purchase order, then the cost of maintaining inventory—which includes such factors as interest, loss of profit, insurance, taxes, etc.

The researchers found that AMF pays an average of $10 to issue a purchase order (the general range is from $5 to $15 each). And the cost of inventory possession boiled down to approximately 2% per month (the general range is from 1½% to 2½%).

Then the optimum buying levels were calculated.

At each material requirement level (left hand column on the table), the total cost of ordering plus inventory upkeep was calculated. Then the lowest total cost was taken as Zero and the penalty of ordering at other levels found by simply subtracting the Zero cost from the total cost at each level.

The result was the table below.

For example: At the $1,600 monthly requirement level, the optimum ordering level turned out to be $1,300 per order. This Zero level was found like this:

Ordering cost—1.23 orders per month x $10 per order	$12.30
Inventory cost—on the average, half of $1,300 inventory in stock. Then 2% of $650	13.00
Total cost per month	$25.30

In every case, the total cost was greater at the other ordering levels. For instance, at the $200 per order level:

Ordering cost—8 orders per month, at $10 per order	$80.00
Inventory cost — half of $200, or 2% of $100 per month	2.00
Total cost per month	$82.00

Converting the lowest cost to

WHEN AMF ORDERS MATERIAL, IT LOOKS HERE

Dollar Value of Monthly Requirements	Dollar Value Per Order: $50	$100	$200	$300	$400	$500	$700	$1000	$1300	$1600	$2000	$2500
$ 50	$6	2	0	0	1	2	3	6	9	12	16	21
100	14	6	1	0	0	1	2	5	8	10	14	19
200	32	12	3	1	0	0	1	3	6	8	12	17
300	50	20	6	2	1	0	0	2	4	7	11	15
400	68	28	9	4	1	0	0	1	4	6	9	14
500	85	36	12	6	2	1	0	1	3	5	8	13
700	124	54	20	10	5	2	0	0	2	4	7	11
1000	161	81	32	16	9	5	1	0	1	2	5	9
1300	238	108	44	23	14	8	3	0	0	1	4	7
1600	295	135	56	31	19	12	5	1	0	1	3	6
2000	372	173	74	41	26	17	7	2	0	0	2	5
2500	469	219	95	55	35	23	11	3	1	0	1	3

HOW THE TABLE WORKS: Zeros indicate optimum buying levels for monthly requirements. Other figures show extra cost per month of ordering at higher or lower levels. For discounts, compare savings to the penalty.

Zero, the penalty for buying at the $200 per order level would be the difference of $82 minus $25.30, or $56.70 per month, as shown in the table at the $1,600—$200 coordinate.

However, the table does not take into account possible discounts at higher ordering levels. If a discount is possible, the cost advantage is found by comparing the discount savings with the penalty indicated by the table.

Suppose, for instance, that in the example above, a supplier offers a 3% discount for purchases in $8,000 lots.

Monthly penalty for buying in $8000 lots (not shown on the shortened table)	$57.00
Less savings for discount buying. 3% of $8,000 is $240. But, since the $8,000 order would cover requirements for five months, the saving per month is $240 divided by 5	48.00
Excess of penalty over savings	$9.00

In this case, then, it would not be economical to buy at the quantity discount price.

Of course, AMF cannot depend exclusively on its table; other factors such as sporadic or special requirements, strikes, national or international emergencies, must be weighed. The company thinks of its purchasing table as a basic guide or reference point—"all other things being equal." From that point on, inventory policy depends on the quality of management's judgment, its forecasting ability, and just plain good luck. ●

Why Workers Quit

Lack of recognition—a feeling that achievements are not being made known to others—is the biggest non-monetary reason workers quit jobs, a University of Michigan (U.S.A.) study revealed.

Other areas that turned out to be significant reasons for quitting were job autonomy and evaluation. Workers who quit were more prone to feel they did not have an area of prime responsibility or that the standards for judging their performances were not just.

(Business Week, March 22, p192)

▶ YOU AND YOUR PERSONAL AFFAIRS

You will be seeing and hearing more and more of the Atomium—the symbol for the Brussels Universal Exposition of 1958. This giant structure of nine steel-and-plexiglass spheres—each housing an exhibit of atomic energy—will become as widely known as the "trylon and perisphere" that dominated the last great world's fair, held 18 years ago in New York.

Brussels is dedicating its fair to "Mankind." It will be a "testimony of our time"—in science, industry, arts, and ideas. You will want to be there.

Your company may want to exhibit its products. All producers and designers of goods are invited to participate—the exhibits will cover all human activities. Special pavilion space is available for producers from countries not officially participating.

If you expect to be one of the 35 million visitors to the fair—April 17 to October 19, 1958—it is not too early to make plans. The better hotels will be booked to their last spare linen closet—the Metropole, Palace, Atlanta, Le Grand, des Colonies, Albert Premier, and Plaza. Luxury rooms cost from $6 to $12 double, $5 to $8 single. First class rooms are from $4 to $6 double, $3 to $5 single.

The Belgian government is building the world's largest motel (a "motel" is a modern wayside inn—combining "hotel" and "motor"), with 2,000 twin-bed rooms at $5 a day. And Logexpo, the committee on housing for the fair (c/o Commission General du Gouvernement, 28 Putterie, Bruxelles), is mobilizing all available accommodations within miles of Brussels. Late planners will probably be lucky to find space 48 kilometers away in Antwerp or in Ghent, 53 km. away.

Cities in Europe are, of course, relatively close together, and transportation is good. Sabena Belgian Airlines operates a scheduled downtown-to-downtown helicopter service between Brussels and several cities. It is only 265 air kilometers from Brussels to Paris; 175 kilometers to Amsterdam; London, 320; Cologne, 178; Frankfurt, 315.

Travel agents and airlines can prepare special "package" trips, including specified places and events, with all costs, connections, and hotels included. You might want to attend the annual trade fairs—in Utrecht or Amsterdam, Cologne, Frankfurt, or Paris. April is tulip time in the Low Countries. And don't forget German and French wine, and the Brussels sprouts, endive, meat dumplings and stewed eels, mussels and chips and black pudding, and the strong local beer—Faro, Lambic, Gueuze Lambic, Kriek Lambic.

●

This month is Personal Affairs Month in Freeport, Long Island (U.S.A.), an outlying suburb of New York City. Life insurance, estates, taxes, wills, stocks and bonds, and a variety of other subjects are being discussed at luncheons and dinners, clubs, and public meetings. It's a good idea.

●

German-speaking and French-speaking businessmen will soon be able to talk directly over the telephone—by using a new direct translation service opening in West Germany. Later, the Tel-Interpret agency will also handle Italian, English, Dutch, Danish, and Swedish conversations.

Venezuela's high standard of living continues to grow with the help of energetic businessmen like Emilio Sanchez of Burroughs

His business is modernizing business

IN Central and South America, Venezuela ranks highest in per capita average annual income. It's the second largest producer of oil in the world. And this country has educated itself practically overnight to adjust to modern economy. The results are everywhere.

Venezuelan businessmen pull more profit from volume production with the support of modern business systems and machines. And Burroughs men such as Emilio Sanchez are providing them with the latest business systems and machines available.

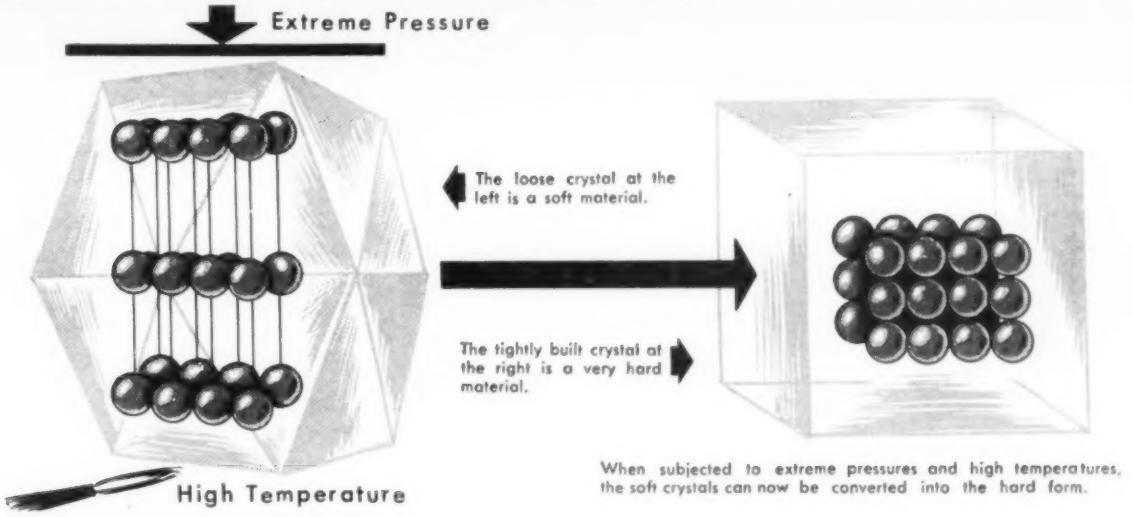
Grocery clerk, accounting clerk, and office manager of a hardware store, Sanchez became a sales trainee for Burroughs' Caracas office in 1952.

After extensive training in Caracas, he was brought to Detroit for further training at Burroughs' home office . . . world clearing house for the latest developments in business methods. Today, he is a zone sales manager.

Since his return to Caracas, Sanchez has extended Burroughs services to a growing list of satisfied clients.

Businessmen the world over are looking to the Burroughs man, like Emilio Sanchez, to provide them with the methods and machines to keep pace with modern-day economy. The Burroughs man offers management everywhere the most advanced and complete line of business machines available.

Call *your* Burroughs man and let his knowledge and experience help solve your business problems. For his address, write to Burroughs Corporation, Detroit 32, Michigan, U.S.A.


Extreme Pressure
The loose crystal at the left is a soft material.
The tightly built crystal at the right is a very hard material.
High Temperature

When subjected to extreme pressures and high temperatures, the soft crystals can now be converted into the hard form.

Science Looks Beyond the Diamond

Digested from BUSINESS WEEK, Mar 2, p78; CHEMICAL WEEK, Feb 23, p64

"Superpressure" research, working with materials at extreme pressure and temperature, has uncovered an entirely new substance. It has never been found in nature —indeed, science had no reason to believe such a substance existed.

Borazon is the new material's name. Actually, it is the synthetic cubic form of boron nitride after it has been subjected to "super" pressure (illustration, above). It is at least as hard as the hardest substance nature can offer: Borazon easily scratches a diamond, and remains hard at temperatures where a diamond — literally — burns up (pictures, next page).

Borazon was developed by the U.S.A.'s General Electric Co. Its birthplace is the same research laboratories where synthetic diamonds were made two years ago.

Trying to make borazon, reports its discoverer, was like trying to catch a special kind of fish that no one had ever seen, in a strange lake. The researchers were not sure (1) whether the lake had any such fish or (2) whether any lake anywhere had such a fish.

The importance of the discovery goes far beyond the fact that a new cutting material will become available for industry. For the first time, man has created a crystal of a material he had good reason to believe could not exist. Now the possibilities are good that soft materials can be converted into synthetics that may be even harder than borazon.

Industry's growing needs will add impetus to the search:

—The oil industry wants a bit harder than the diamond, that will not grind itself away as the diamond does.

—Automakers want a new abrasive that will allow them to grind steel castings at higher speeds than at present.

—Toolmakers working with such tough materials as tungsten carbide, want new materials to coat their grinding wheels.

Diamonds have one serious drawback from an industrial point of view. Diamond chips used on a grinding wheel oxidize at 900°C. Borazon is reputed to withstand more than 2000°C. So the material has promising potential for industrial applications. General Electric is not hedging on the outlook for these applications either. The company's director of research says: "We believe borazon's resistance to oxidation will make possible superior methods of mounting stones in industrial tools, and allow bits and wheels to operate at higher speeds."

Borazon is the first unique product to come out of GE's special press that handles pressures up to 112,000 atmospheres and temperatures of over 2800°C. for hours at a time. This is the press that GE used to synthesize diamonds.

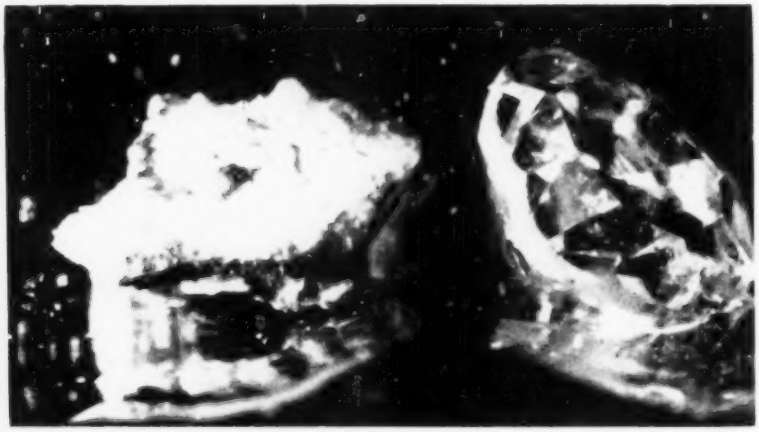
Ordinary boron nitride (a white solid material similar to graphite in slipperiness, density, and crystal structure) is borazon's raw material. Boron nitride changes to borazon at 70,000 atmospheres pressure and 1700°C. It has a crystal structure and density similar to that of diamond. X-ray diffraction patterns confirm the similarity of the boron nitride crystals to those of the diamond with these differences: (1) The spacing between atoms is slightly larger in cubic nitride and (2) Its structure involves two different kinds of atoms instead of the one (carbon) in the diamond.

GE's product, to date, consists of tiny crystals—like grains of sand—which are generally black, brown, or dark red. Milky white, gray and yellow crystals have been made. Individual crystals sometimes grow together to form lumps as big as a pencil eraser. Even the separate crystals (about 0.8 millimeter in diameter) will be useful in industry, GE believes.

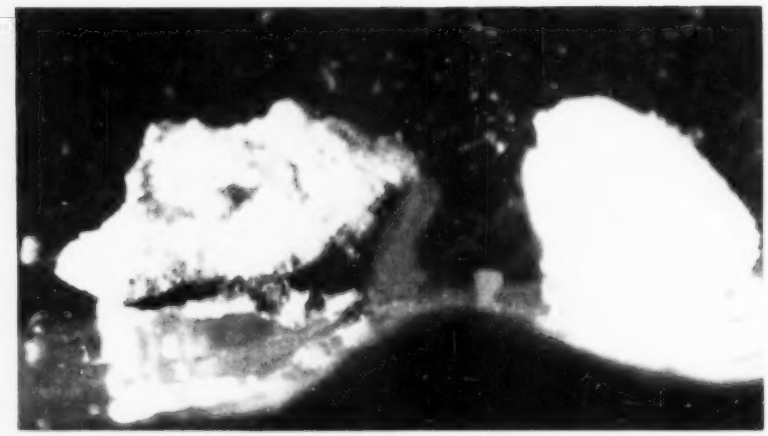
What is most exciting, though, is the encouragement that the borazon discovery is certain to

give to high-pressure materials research generally. GE, for example, expects to use the borazon techniques in a continuing search for even harder materials. And researchers should be able to get still higher pressures and temperatures. If that is the case, the world may see a whole new family of materials in the future, all tracing their ancestry to the discovery of borazon. ●

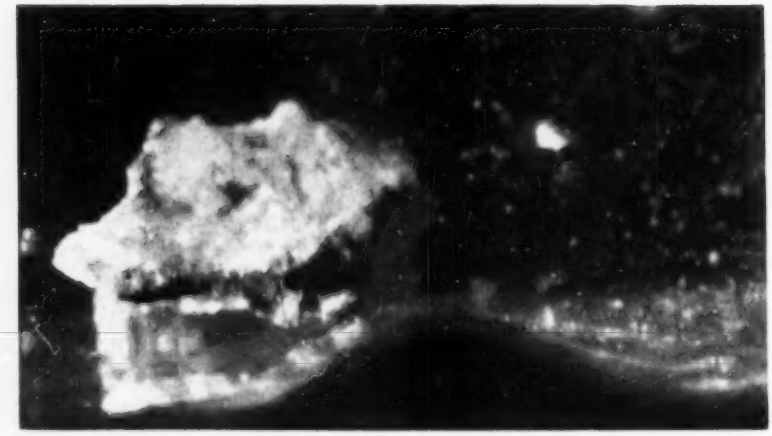
Borazon Withstands Heat, Diamond Burns



START: Borazon, diamond begin test . . .



60 SECONDS: Heat affects diamond (right) . . .



2½ MINUTES: It vanishes like any piece of coal.

Fats: Villain in Heart Trouble?

Digested from CHEMICAL WEEK, Mar 23, p58

Watch for more and more articles stressing diet as a possible cause of heart disease. The articles encourage an idea that goes somthing like this: Fats stimulate the formation of body cholesterol, and a high level of cholesterol in the blood is a forerunner of heart trouble.

Neither supposition has been proved, although the blood-cholesterol level offers the single best clue to the cause of coronary heart disease and hardening of the arteries. Right now research along this line is becoming one of the major efforts in medical history.

One possibility is that the more highly "saturated" fats (those that are solid at room temperature) cause the formation of high levels of cholesterol in the blood, whereas the "unsaturated" fats (liquid at room temperature) do not. As a result, butter, lard, meat fats, hydrogenated vegetable shortenings are being viewed with suspicion, while the oils of corn, peanut, sunflower, and the like are not.

If solid fats do prove to be the culprits, edible-fats manufacturers could change their products and processes to counter the menace. There are these possibilities:

—Change conditions in the conversion of edible oils into edible fats to vary the degree of saturation, while retaining required amounts of essential fatty acids.

—Vary emulsification techniques to obtain greater unsaturation with as little sacrifice of solidity as possible.

—Find new additives (for example, anti-oxidants) that will enhance stability of the unsaturated, liquid products.

Much of the impetus for research stems from data indicating that the U.S. death rate from arteriosclerotic (hardening of the arteries) and coronary heart disease is the highest in the world. Elsewhere, particularly the Scandinavian countries, the death rate is also rising. And as living stand-

ards continue to improve, people around the world will be eating better, and eating more fats. So finding the answers becomes still more urgent for the researchers.

These deaths are predominantly caused by interruption of blood flow to heart muscle. Abnormal deposits of cholesterol combined with fatty acids and protein block the arteries.

Tests have been carried out in which rats and other animals are fed controlled diets to determine the effect on blood cholesterol levels. But animal tests do not always correlate with tests on humans. Many observers, including some meat packers, think research on humans is the only reliable approach.

That is why work at the Institute for Metabolic Research (Oakland, California, U.S.A.) is attracting attention. Beginning in 1950, volunteer patients were fed nothing but vegetable fat emulsions. Contrary to expectations, the cholesterol level in the blood dropped and stayed down during the administration of the high-fat diet. When animal fats were substituted for vegetable fats, the cholesterol level rose, stayed up.

Further research pointed to fatty acids. Now the Institute is feeding a group of research patients fats derived from vegetable sources such as safflower, soya, cottonseed, linseed, corn oil, etc. All contain unsaturated fatty acids. With these, the cholesterol level has gone down. On the other hand, a diet containing coconut oil causes the cholesterol level to go up. And coconut oil has practically no unsaturated fatty acids.

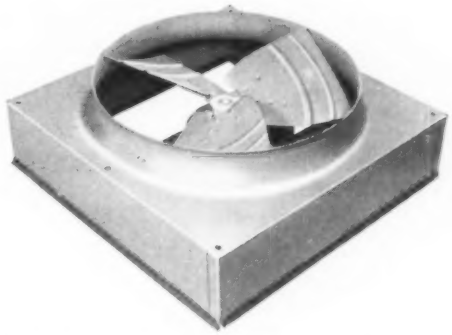
The Institute's director says: "While there's no question about the effect of vegetable oils and essential fatty acids on cholesterol levels, there should be no implication that all the public has to do is take a couple of tablespoonsful of safflower oil daily to avoid heart trouble."

Animal studies are by no means obsolete in edible-fats studies. The University of Southern California (U.S.A.) is looking into multigeneration and longevity feeding studies of rats. The purpose of its program is to discover all the effects, including the effect on cholesterol metabolism, of hydrogenated vegetable fats in the diet. Test animals are in "excellent nutritional condition." While some results cannot be translated to humans, the University feels that fat metabolism in rats does run parallel to that of humans.

Furthermore, animals have one great advantage over humans. Animals can be sacrificed at various stages to determine cholesterol buildup. Only after death can human cholesterol deposits be studied. Cholesterol buildup in the arteries cannot be observed during a human's life.

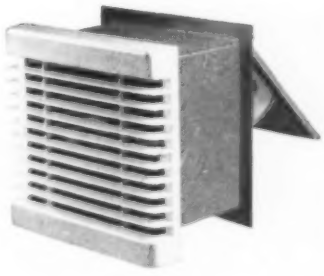
Beside diet, factors such as stress—and even combinations of factors—must be considered. The Harvard Medical School (Boston, Massachusetts, U.S.A.) is studying the relationship of exercise to high-fat diets. But there are many unknowns. Even with the powerful incentives researchers have, it may be a long time—5 to 10 years at least—before most of the facts are known. ●

Dependable Fans for Home Ventilation and Comfort Cooling



MODEL CA VENTURA ATTIC FAN – easy to install, built for a lifetime of cool comfort. Whisper-quiet operation: 24- to 48-inch wheel diameters. Available with side panels and rubber cushion strips which permit either vertical or horizontal mounting. Write for Bulletin 7514.

AEROPEL HOME VENTILATOR —designed for kitchens, bathrooms, laundries, utility rooms. Removes greasy smoke, fumes and odors in seconds. Send for Bulletin 4714.



AMERICAN BLOWER

Division of AMERICAN-Standard

DETROIT 32, MICHIGAN

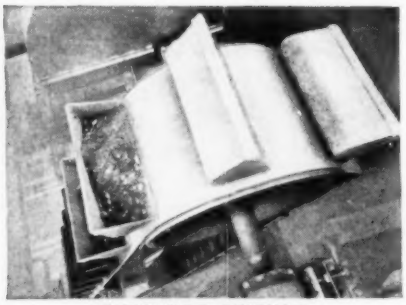
This equipment can also be furnished by

AMERICAN-Standard PRODUCTS (CANADA) LTD., TORONTO, ONT.

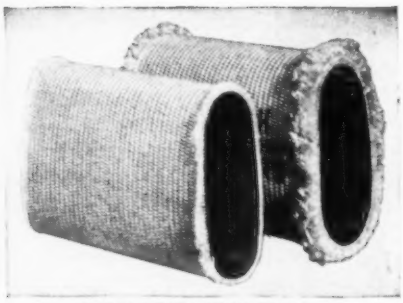
CANADIAN SIROCCO PRODUCTS

Bulk Materials Handling Systems

CONVEYOR BELTING

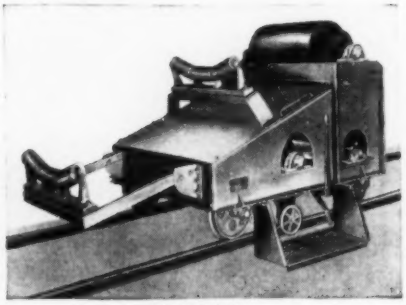


ELEVATOR BELTING

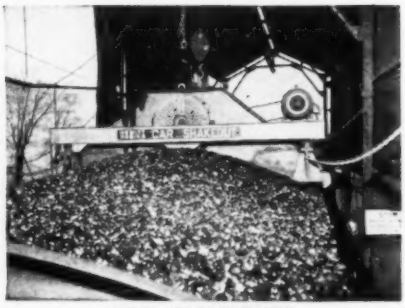


MONARCH FIRE HOSE

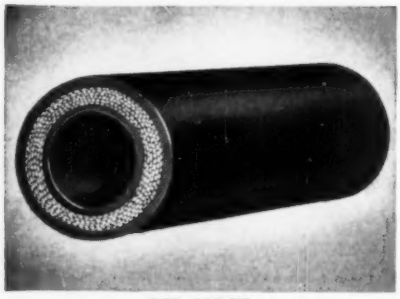
ENGINEERED CONVEYORS



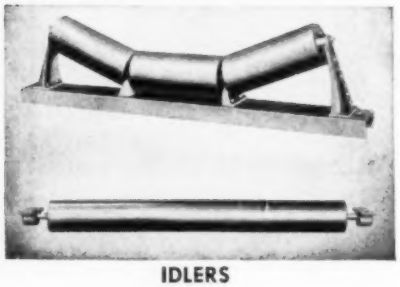
TRIPPERS



CAR SHAKEOUTS



AIR HOSE



IDLERS

HEWITT-ROBINS MACHINERY PRODUCTS. A complete line of specialized machinery for conveying, screening, sizing, elevating, distributing, blending, and storing loose bulk materials of every description.

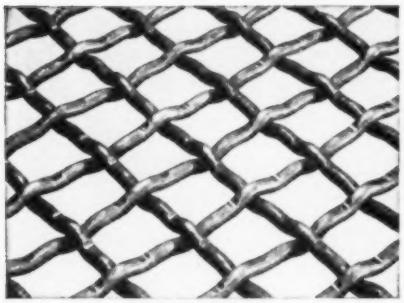
HEWITT-ROBINS RUBBER PRODUCTS. A wide range of rubber conveyor belts, transmission belts, industrial rubber hoses, and molded rubber products.

HEWITT-ROBINS ENGINEERING SERVICE. Our engineers' vast experience qualifies them to solve almost any bulk materials handling and processing problem which might arise.

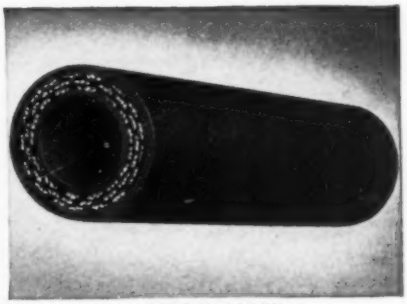
By dealing with Hewitt-Robins you'll save time and trouble . . . our products and services will furnish you with better integrated bulk materials handling systems and better designed and constructed processing equipment to solve your particular problem.

HEWITT-ROBINS
INTERNATIONAL DIVISION
STAMFORD, CONNECTICUT, U.S.A.

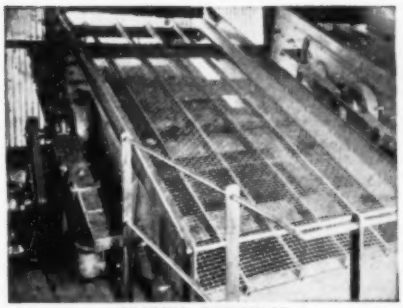
and Equipment for Industry



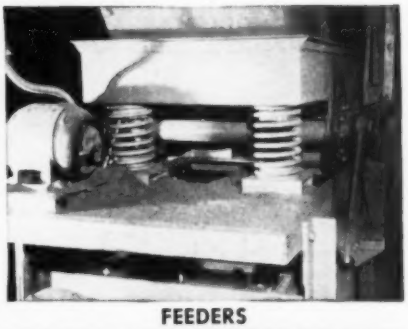
SCREEN CLOTH



STEAM HOSE

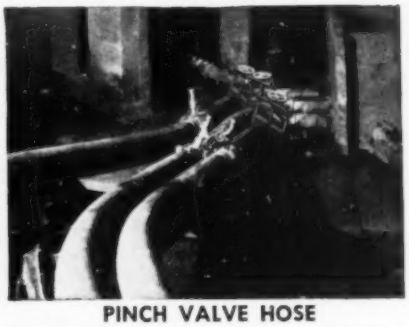


GYREX SCREENS



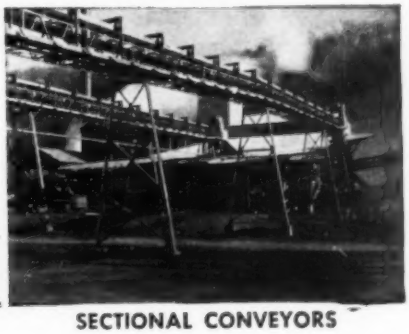
FEEDERS

ELIPTEX DEWATERIZER



PINCH VALVE HOSE

STACKERS



SECTIONAL CONVEYORS

Here is a partial list of HEWITT-ROBINS PRODUCTS that will help you cut handling costs and increase operating efficiency.

MACHINERY

Belt Conveyors
Belt & Bucket Elevators
Car Shakeouts
Conveyor Idlers
Dewaterizers
Mechanical Feeders
Mine Conveyors
Reclaiming Systems
Screen Cloth
Self-Unloading Boats
Ship Loading & Unloading Systems
Stackers & Trippers
Vibrating Conveyors & Screens
RoBINtronic® Bin Level Indicators

INDUSTRIAL RUBBER PRODUCTS

Belting:

Chute and Launder Lining
Conveyor
Elevator
Skirtboard Rubber
Transmission

Hose:

Acid
Air & Air Drill
Dredge Sleeves
Fire
Flexible Rubber Pipe
Fuel Oil & Gasoline
Gasoline Pump
Oil Suction & Discharge
Pinch Valve
Road Builders'
Sand Suction
Sea Loading
Servall®, All-Service
Steam
Vacuum & Air Brake
Water & Water Suction
Welding, Twin-Weld®

A-3202-X

CANADA, Montreal 1, Que., Hewitt Robins (Canada) Ltd., 2042 St. Catherine St., W.
ENGLAND, London W. 1, Hewitt Robins (Great Britain) Ltd., 8 Cavendish Place
FRANCE, Paris 2e, Hewitt Robins International, 9 Boulevard des Italiens
NETHERLANDS, Amsterdam, Hewitt Robins (Holland) N. V., Vondelstraat 57
SOUTH AFRICA, Johannesburg, Robins Conveyors (S.A.) Ltd., P.O. Box 4736
EXPORT DEPARTMENT, New York 17, N. Y., Hewitt Robins, 370 Lexington Ave.

Textiles: Meeting the Challenge

● No industry is so basic—as basic as the shirt on your back. It employs 25-million around the world.

● Can it solve its problems—through rising population, more productivity, "fabric engineering?"

● Here, MANAGEMENT DIGEST takes a close look at the industry and how it is facing the future.

Though it was made in Japan, the picture above could have been taken in just about any country in the world.

Seen from the older, industrialized nations, the picture is static, not very exciting. From the "new" and industrializing nations, the picture can be pleasant indeed. The case of Pakistan (chart, next page) is more dramatic than most, but the trend is the same in dozens of countries.

The textile industry is old, of course: It fathered the industrial revolution. It is old even in many of the "new" nations. India's first mill dates from before the turn of the century—and even 10 years ago India was producing 96% of its basic requirements in textiles.

Probably of all organized manufacturing industry, textiles have the widest range of management—from the most inefficient to the most modern. There are many lessons for management in the paradoxes and economics of textiles. Trade patterns have shifted drastically in the past 20 years; consumers are changing their buying habits. Study textiles, and you can see the basic elements of worldwide industrial development.

I. Industry Portrait

Textiles are as basic as the shirt on your back. They are the logical place for a less developed nation to start industrializing. Foreign exchange savings are immediate and substantial—particularly for cotton-growing countries. A textile mill requires relatively little capital, relatively simple technology and labor skills. Finally, textile manufacturing has a high labor cost factor.

This labor factor is, in many ways, a key to the textile world. The textile industry provides livelihood to a lot of people (an estimated 25-million people around the world); and employment is as basic a problem as foreign exchange for the poorer nations of the world. The labor factor also allows inefficient managements in low-wage countries to compete on equal terms with efficient managements in high-wage countries.

This is not to say that managements in low-wage countries are all inefficient. They are not. But the more efficient their methods, the greater competitive advantage they have. Assume that all mill managements were in direct competition with each other, with no trade barriers, no raw material advantages. There is little question who would win out in such a competitive struggle.

The crux of the matter is this: Though textile technology is changing, the difference in productivity between the older and most modern textile machinery is

not tremendous. The process is still to clean and straighten the fibers; then gradually, in stages, draw out and twist the strands into the final yarn.

The only major improvements have aimed at reducing the amount of labor required. If you look at the picture at the left, it is apparent that the material in process must be taken off one machine, put on the next. This is where the labor comes in; this is where the machinery improvements have been made.

Better work methods and management techniques have aimed at the same result: to reduce the labor content. High wage scales make it economical to invest in methods engineers and consultants. And even minor machine improvements become important.

II. Wages and Quality

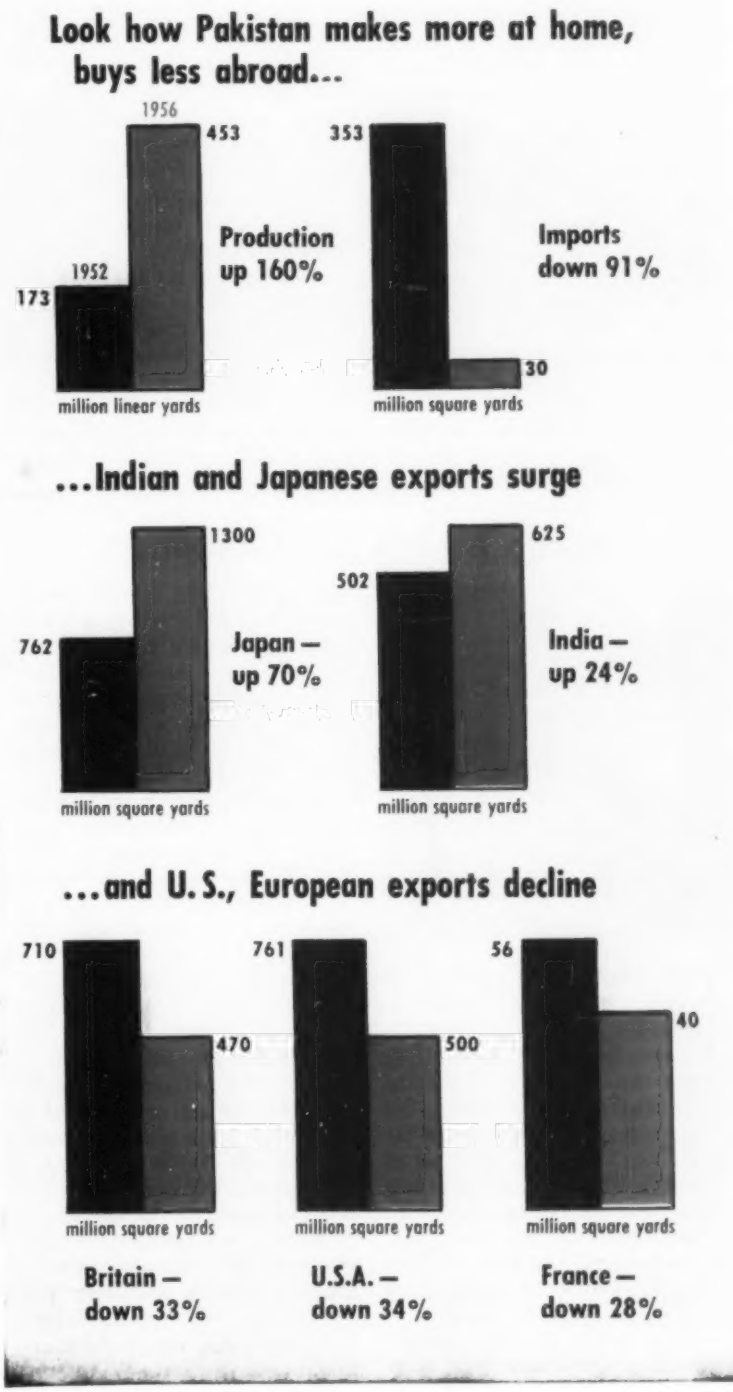
With these characteristics in mind, competition in the textile industry can be put into perspective. In the U.S.A., which generally is conceded to have the most efficient textile industry, labor content of woven cotton goods amounts to 30% to 35% of the mill cost. This figure gives a good yardstick, for cotton and spun-rayon amount to well over three-quarters of the world's textile production.

The difference in wage scales between the U.S.A. and most other countries of the world is much greater than the difference in the productivity between new and old machines. For example, European wages run about a third as much as U.S. wages. To compete on equal terms, therefore, European equipment and methods can be considerably out of date. Japanese wages run about 13 times lower than U.S. wages, and, obviously, considerably below European wages. Indian wages run even lower.

As this wage cushion gets larger, machinery and management methods can become progressively out-dated—and the mill can still compete. Put together low wages with good management, and you have competition that is hard to beat—except through trade barriers.

Another important characteris-

Cotton Cloth: Some Cases in Point



tic of the textile industry is that "efficiency"—getting the most production out of machine and labor time—is not closely associated with quality. The tradition of the industry is to slow production to improve quality. And old equipment will turn out yarn just as fine as new equipment.

Finer yarns, however, generally require careful quality control and higher labor skills. For this reason, the low-wage countries have taken over the medium and low-quality markets, but not the finer goods market.

There is a paradox here.

It is a high-volume market that keeps a textile industry healthy in terms of employment and size. But, the value of high-volume products is much less than for fine goods. Expensive woolens and worsteds, in particular, have kept the sterling value of British exports from dropping as much as the volume. And it is this emphasis on quality—more and more becoming a question of dyeing and finishing techniques—that keeps European and U.S. textiles in competition with the low-wage producers.

III. The Production Race

How much have the industries in Europe and the U.S. actually been hurt by the upsurge in production around the world?

This year, American mills will turn out roughly the same number of yards they did 10 years ago, but with 25% fewer workers, 47% more productivity. And textile companies are making a good profit. But they have raised such an outcry against the "Japanese threat" that some are having trouble raising capital.

There are some students of the industry who say there has been a lot of crying over "spilled milk." U.S. textile production, they recall, was beginning to decline before World War II. Then the war, followed by Korea, plus government price supports, boomed the market out of all proportion. New exports to countries whose textile production was wiped out during the war also inflated the picture. Now, in the absence of these artificial stimuli, production is back down to about where it normally would have been. In other words, some observers believe that instead of being hurt, the big U.S. textile producers have enjoyed 15 years of abnormal profits. To a lesser extent, the same is true for Europe.

Now, there is a concerted emphasis in Europe on technological improvements (see page 15). And observers say that this program will make for a big increase in productivity standards within the next five years.

But, at the same time, the low-wage countries are not hanging back in the technological race. In Japan there are a total of 47,000 textile mills—as compared to 5,000 in the U.S.A. But 10 large companies control 63% of the total cotton spindles and 20% of the looms. And in the knitting industry, only eight out of 3,600 mills listed in 1955 employed 300 or more workers.

These big companies hold the future of Japan's textile industry; and they have made significant quality improvements since the war. Between 1951 and 1955, the average cotton-yarn number (the higher the number, the finer the yarn) increased in fineness from 27.2 to 30.5.

Japanese exports reflect this upgrading. In 1953, below 60% of the cotton-yarn exports had a fineness of 20 or over; but by 1955, over 80% of cotton-yarn exports were above 20. And exports of yarn as fine as 60—the sewing thread class—increased sharply. India is also upgrading its product. And this finer production increases Japanese and Indian competitiveness with European and North American mills.

The Asian mills are also making progress in dying, bleaching, and finishing—the final operations that distinguish the best fabrics of Europe and North America.

The most significant trend, however, in the Japanese textile economy—and in most of the other industrialized nations of the world

How Toyobo Meets the Challenge

KOJINO ABE, president of Japan's giant Toyo Spinning Company (Toyobo), says he is "extremely unhappy" about U.S. (or any other) quotas on Japanese textile products, but his company will observe the restrictions. Abe's firm is one of the Big Three of Japanese textile—first in cotton, second in wool, sixth in rayon—and it is a good example of how progressive textile managements are meeting today's challenge.

Last year Toyobo's profits rose to $12.5-million, from $4.9-million in 1955, despite heavy taxes and high interest rates. Cotton accounted for over half the sales, and over half the cotton was exported—in fabrics to North America, Australia, and Europe, yarn to Burma, Indonesia, Pakistan, Hong Kong.

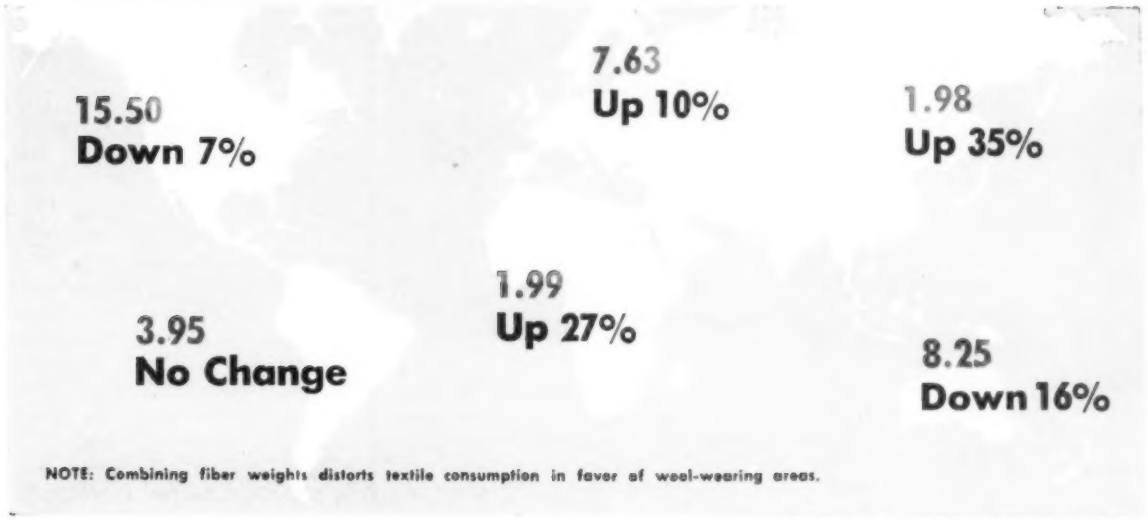
Production has been streamlined with a $60-million program, now 80% complete. And Toyobo has spread abroad—a new cotton mill in Brazil, another jointly owned plant in Ceylon.

But synthetics are getting the most stress. Last year's bright spot was rayon—exports up 100%—and the company's new $33-million integrated rayon plant will go into operation this year. Toyobo is also half partner in a new acrylic fiber plant.

Hurrying the company along are 150 research technicians—using radioisotopes in synthetics research—and technical agreements with U.S. companies for applications of pre-shrinking, resin finishing, rayon stabilization.

Per Capita Consumption: Up in some areas, down in others

Kilos per capita of wool, rayon, cotton.
Percentage change in consumption from 1949.



NOTE: Combining fiber weights distorts textile consumption in favor of wool-wearing areas.

Source: Food and Agricultural Organization, United Nations

—is the increasing emphasis on the production and use of synthetic fibers.

Compared to the pre-war figures, man-made fibers have increased from 6% to 20% of total Japanese production, while cotton has decreased from 80% to 70%. (Wool has been rebuilt to its same proportion—about 10%.) The high cost of importing cotton, competition from India, and restrictions against Japanese exports has forced this shift.

Japan is already one of the world's largest manufacturers of rayon fiber, and the newer synthetics are going into production. Other areas, too, are following in the race for textile production. Latin America and the Middle East are making rapid strides.

Modernization is a difficult task in some cases, particularly in Latin America. Some countries have laws that restrict work assignments and thus perpetuate inefficiency to maintain high employment. However, higher quality finishes are being produced, and the old hand loom is virtually an anachronism.

And at least one Latin American country, Brazil, faces the same problem of overcapacity that plagues textile men in the U. S. A., Japan, and Europe. Brazilian mills entered this year with warehouses filled with inventory, but short of cash to purchase raw materials, much less to modernize.

This situation is not new to the textile industry. In fact, textiles are traditionally a "boom or bust" industry. And some authorities think there is more "bust" in store.

IV. Long-Range Problems

Whatever the short term outlook, the long-range problems of the industry are not getting the attention they deserve.

Textile economists see little to be happy about in consumption figures. True, world population is rising, but not fast enough for the textile industry. World per capita consumption is increasing, too—but only because of the huge gains in Africa and Asia, where textile production is going up even faster. In North America, with its prodigious living standards, per capita consumption has actually decreased substantially. One reason cited in the U. S. A. is the trend toward informal dress. Watch Europe, too. Per capita consumption there will drop as the rapid post-war rise in living standards levels.

Take vests off the men, a few inches off womens' dresses, throw away the heavy underwear, and the result is a lot less yardage for the textile industry. Textiles have also lost markets to paper and plastics products. There are promising industrial markets, but they probably cannot compensate for losses in apparel.

Furthermore, once a certain standard of living is attained, increases in buying power do not go proportionally for textiles. Other less essential goods, backed by high-pressure selling campaigns, take up a greater percentage of the consumer's cash. Textiles do not lend themselves to large-scale sale on extended payment terms and there are no new techniques for selling them.

Finally, some experts say that mass production itself—integrated mills emphasizing standardized fabrics and fewer specialties—tends to decrease per capita consumption above a basic level.

Within this static framework, a bitter battle of raw materials is going on. The textile-mill man cares little what fiber he runs—it depends on the market. But raw materials people care, and synthetics are taking up more and more of mill production.

Rayon has already cut sharply into cotton—it now accounts for close to a quarter of world textile

Only underwood has the "Golden Touch"

Sales and Service Throughout the World

The Key to Successful Letters! Responsive touch plus perfect printing! Other Golden Touch Features: Keyboard Margins, Dual Carriage Returns, Fingertip Impression Control Dial for up to 20 clear copies, Full Writing Visibility and many distinguished type styles to suit your individual taste.

Consult your local Underwood dealer or write to—

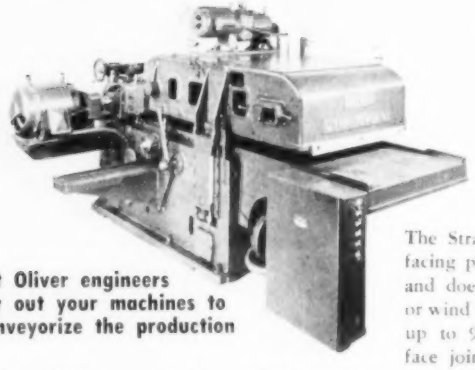
UNDERWOOD CORPORATION

International Department

1 PARK AVENUE, NEW YORK 16, N.Y., U.S.A.

TYPEWRITERS • ADDING MACHINES • ACCOUNTING MACHINES

OLIVER woodworking machines do the finest work at low cost



Let Oliver engineers lay out your machines to conveyorize the production

With an Oliver conveyorized layout three men can process 24,000 ft. of lumber in 8 hours; two men up to 12,000 ft. Cuts man-power; speeds production. Soon pays for itself.

Oliver makes many machines: Band Saws, Saw Benches, Surfacers, Jointers, Jig Saws, Shapers, Tenoner, Sanders (Belt, Disk, Spindle), Woodturning Lathes, Borers, Mortisers, Multiple Spindle Carvers, Milling Machines, etc. Write for details.

The Straitoplane takes stock out-of-wind and planes both sides smooth in one pass

The Straitoplane does the work of a facing planer and single surfacer . . . and does it better! Planes out warp or wind up to ¼" on each side at speeds up to 90' a minute. Bottom side is face jointed; top side planed smooth to desired thickness. The Straitoplane takes twisted stock of any length, 1¼" to 36" wide, ½" to 6" thick. It planes pieces as short as 16" when fed singly. Many narrow strips can be surfaced at one time. No other machine matches the production of the Straitoplane. Get all the facts.

OLIVER MACHINERY COMPANY, GRAND RAPIDS 4, MICHIGAN

consumption. Rayon, like cotton, is a cellulose (regenerated) fiber, and it can be used as a substitute for cotton in almost all of the 200 end uses that cotton counts as its customers. Over 40 nations now produce rayon—with the emphasis on nations that do not grow cotton.

And more rayon is being spun or used in blends. In 1949, rayon production was divided 60% continuous filament, 40% cut staple. By last year, this relationship was just the reverse.

In the "cotton" industry in Britain, for example, rayon staple accounts for 18% of the raw material—and even the more conservative wool industry uses 8% rayon. Furthermore, the proportion of total cotton to rayon production has decreased from 8-to-1 to about 3½-to-1 in recent years.

Of the noncellulosic synthetics (sometimes called "true" synthetics) only nylon—with its hosiery, tire cord, etc.—has won a substantial place for itself in the market. These newer synthetics still fall into the special property class, and many producers now admit that the publicity about "miracle" fibers was considerably overdone. Each "family"—the acrylics, polyethylenes, proteins, polyvinyls, and a new one called dinitriles—can beat wool in one property or another, but none can match its performance as an apparel fabric.

Now "fabric engineering" is coming in—and it is a significant advance in textile technology. All kinds of "crimping" and "bulking" processes are being developed to make the synthetics more like wool. And as mill processing and consumer information accumulate, there will be more and more blending of fibers for specific end uses.

For the natural fibers, the greatest potential is in resin finishes, wrinkleproofing, mothproofing, pre-shrinking, washability, and similar treatments. Cotton is even being modified chemically to change its properties.

Enthusiasts say these developments promise a genuine revolution in textiles. They are taking place rapidly in the nations with advanced technologies—the future holds fierce competition in the shrinking international market. ●

VAUXHALL VICTOR SUPER styling approaches that of American autos.

HOLDEN STATION SEDAN is Australia's first home-built station wagon.

New Members of GM Family

The two new automobiles pictured above mirror trends that are just now appearing among manufacturers outside the U.S.A. Both are brand new, and both are made by affiliates of General Motors Overseas Operations. The Vauxhall Victor Super (top), made by Vauxhall in England, has some typical U.S. characteristics, but it is still in the familiar small-car class.

The Holden Station Sedan (bottom), product of GM-Holden, Australia, is the first station wagon to be built entirely in Australia. Besides the Station Sedan, Holden has announced a coupe utility (similar to a pickup truck) and a panel van (sedan delivery). First production will go to Australia's internal market. As output goes up, vehicles will be made available for export.

All three of Holden's new models are larger and wider than any of the company's previous models. In fact, they are larger than most wagons made outside the U.S.A.

The Vauxhall Victor Super's characteristics include a wrap-around windshield and rear window, and an extra-large trunk. These are trademarks of cars made in the U.S.A.

Despite these features, the Victor Super is still a small car. It seats four and is powered by a 49-horsepower four-cylinder engine. This puts the car at about the upper limit of the class of vehicles that accounts for 48% of world sales (excluding the U.S.A.).

Oscillating Conveyor

The trough of a new oscillating conveyor is supported by cast aluminum rocker legs and steel coil springs. Motion is imparted to the material carried in the trough by means of a constant-stroke eccentric drive. The drive produces an upward and forward oscillating movement, for a gentle, continuous forwarding of materials.

The conveyor is available in fully assembled sections of 5- to 10-foot lengths, in trough widths of 10 and 20 inches, and in 10 gage or ¼-inch trough thickness. Sections can be assembled in lengths up to 100 feet. **(Link Belt Co., 2680 Woolworth Bldg., New York 7, N. Y., U.S.A.)**

Ten-Ton Wagon Crane

Model 155WC 10-ton wagon crane can travel, lift, swing or boom independently with full loads through a full 360°. Other features, such as planetary boom hoist, scientific weight distribution, and all welded steel construction have also been incorporated.

The high cab allows full circle visibility and contributes to time-saving operation in close quarters. Direct acting hydraulic controls reduce operator fatigue. **(Harnischfeger International Corp., Milwaukee 46, Wisconsin, U.S.A.)**

Cutting Attachment

A new light duty oxyacetylene cutting attachment, the Airco Style 1490, attaches to the Airco Style 400 lightweight cutting torch. The attachment weighs 13 ounces and is 9½ inches long.

Cutting range is up to one-inch-thick steel. A firm gas-tight seal is assured with tapered gas sealing rings, and hand tightening makes a firm joint. A diaphragm-type cutting oxygen valve eliminates the need for valve packing and prevents gas leakage. **(Airco Co., International, 150 E. 42nd St., New York 17, New York, U.S.A.)**

for Sale

COMPLETE EQUIPMENT FOR TIRE FACTORY

Includes all machinery necessary for fabrication of tires and tubes for passenger automobiles of all sizes as well as for light and heavy trucks. All equipment is in excellent working condition. If desired can supply specialized personnel to supervise installation and start-up of production. Available for immediate delivery.

Address all inquiries to :

RÉGIE NATIONALE
DES USINES RENAULT
Billancourt (Seine), FRANCE

Executive Desk

This desk has been designed to give maximum sitting comfort combined with working efficiency. The knee-hole drawer has been eliminated giving the user more freedom while sitting at the desk. There are seven drawers, each with an easily-gripped handle. The deep filing drawer runs on metal suspension glides and is fitted with a filing cradle. An accessories tray is incorporated in the top right-hand drawer.

Desk model C56 is available in two sizes, 5 feet 6 inches by 3 feet and 5 feet by 3 feet. It comes in oak, mahogany, or walnut. **(Carson Bros. [Productions] Ltd., 3/4 Charlotte Road, London, E. C. 2, England)**

MORE PRODUCT DIGEST

Tiny Tractor

A new model R-9 "Speedcat" tractor is only 36 inches wide and 62 inches long, and weighs 1,150 pounds. It has a 1,300-pound drawbar pull. The machine is powered by an 8- to 9-horsepower gasoline engine with in-line transmission. It has three speeds forward and one reverse.

The tractor is manufactured by the Mead Specialties Co., 4114 N. Knox Ave., Chicago 41, Illinois. It can mount numerous attachments including a front-end shovel and dozer blade. **(Lehara Corp., 60 E. 42nd St., New York, New York, U.S.A.)**

New Torch Cuts Concrete, Masonry

The important feature of a new oxy-acetylene torch is a powder cutting process, somewhat similar to that used in cutting stainless steel. Results include piercing a 12-foot thick concrete wall to accommodate an 8-inch pipeline, in 1 hour and 15 minutes; and cutting 960 linear feet of reinforced concrete at cutting speed averaging 1½ inches per minute.

For cutting masonry up to 18 inches thick, the device consists of a blowpipe, held in a nozzle equipped with controls for feed of fuels to the flame, and also the injection of the iron and aluminum powder used in the process. If the cut is to be deeper than 18 inches, the blowpipe is replaced by a lance, up to 18 feet in length and somewhat narrower in inside diameter than the blowpipe. Cuts up to 12 feet deep have been made with the lance attachment. **(Union Carbide International, 30 East 42nd Street, New York 17, New York, U.S.A.)**

Two Questions for Managers . . .

. . . Are you satisfied with the performance of your supervisors and workers?

. . . Would effective training improve their performance?

For twelve years we have helped Latin American industries and governments install and follow up organized training programs in production, manufacturing, preventive maintenance, sales, employee and public relations. References furnished upon request.

Write or cable

DOWNES ASSOCIATES INC.
Management Consultants
216 No. State St. Dover, Delaware, U.S.A.
Cable address: "Downes" Dover, Del. U. S. A.

CONSULTING SERVICES

ORGANIZATION STUDIES
New Product Studies—Incentives
Plant Expansion—Cost Control

INTERNATIONAL DIVISION
METHODS ENGINEERING COUNCIL
718 Wallace Ave. Pittsburgh 21, Penna. USA
CONSULTANTS TO MANAGEMENT
DR. H. B. MAYNARD, *Pres.*
DONALD E. FARR, *Vice. Pres. Latin. AM.*

SAN FRANCISCO MADRID BUENOS AIRES
NEW YORK MEXICO CITY GOTEBORG

JACK R. BARNES
Engineers-Geologists
UNDERGROUND WATER SUPPLIES
Investigations, Test Drilling, Reports
509 West 18th St. Austin, Texas, USA

HALE AND KULLGREN, INC.
Specialists in Processes and Plants for Rubber and Plastics
A Complete Engineering Service
including: Economic Surveys; Process Design; Installation; Contracting and Operation
613 E. Tallmadge Ave. Akron 10, Ohio

Concrete Block Maker

A heavy-duty machine has been developed for the production of hollow blocks, ceiling blocks, paving stones, bricks, etc. made of heavy or lightweight concrete. The machine can be operated fully or semiautomatically and in 8 hours will produce a total of 10,000 8x8x16-inch blocks.

The machine operates on an oil-hydraulic system with up to seven operations per minute. It features an automatic vibration unit. Mold changes can be made simply and quickly. An automatic lifting rack picks the blocks up as they come off the machine. **(Omag Co., Emden, Germany)**

Small Instruments Housed In Fiber Glass Cases

Series 1450 small-sized instruments for indicating, transmitting, and controlling pressure and temperature will be housed in cases made of plastic-impregnated fiber glass.

Temperature range of the 1450 series is from minus 400°F. to plus 1000°F. Pressure range is from 30 inches Hg vacuum to 5,000 pounds per square inch. As pneumatic receivers, the new instruments can accommodate 3 to 27 pounds per square inch signals.

Instrument options include single or dual indicators, single indicator with dual alarms, indicating controller with any mode of control, and indicating transmitter. The transmitter can provide pneumatic outputs, resistance outputs, or differential transformer outputs. **(Fischer & Porter Co., 951 Jacksonville Road, Hatboro, Pennsylvania, U. S. A.)**

Measures Resistance

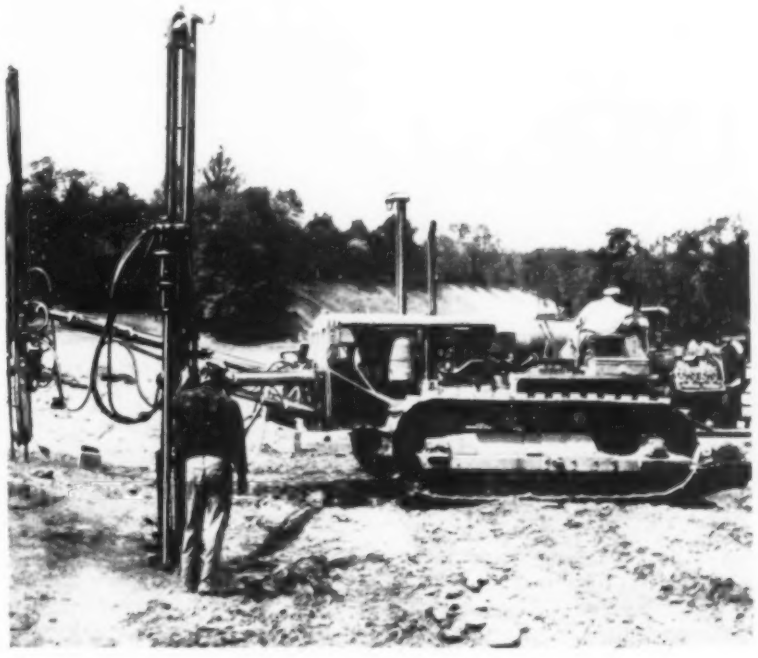
A new portable instrument measures electrical resistivity in micro-ohms per centimeter cube. Results are read from a calibrated dial that will handle metals with a resistivity between 1.0 and 28.0 micro-ohms per cubic centimeter.

The instrument requires a fairly smooth surface (not necessarily flat) with a width of 0.75 inches in a section that is at least 0.02 inches thick. **(Solatron Electronic Group, Thames Ditton, Surrey, England)**

Photocopy Duplicator

A new photocopy duplicator will make instant copies of book or magazine pages as well as single sheets of paper. The unit produces a sharp black on white copy of any original material, including pen or pencil writing, color pictures, and material printed on both sides of the page. Copies are produced on a non-wrinkling paper which handles easily and is suitable for filing.

For further flexibility, photocopying can be combined with offset duplication to produce hundreds or thousands of copies in a minimum of time. The unit accommodates an aluminum transfer offset plate. It takes less than two minutes to copy original material on this plate and start the offset duplicating operation. The plate will produce several thousand copies. **(A. B. Dick Co., 5700 Touhy Ave., Chicago 31, Illinois, U.S.A.)**



Drilling Rig Mounted on Tractor

The Blue Brute tractor-mounted drilling rig is designed for production blast-hole drilling on rock excavation projects, quarrying, ditching, and open-pit mining. It is a completely self-contained unit carrying its own air compressor and driven either by the tractor engine or an auxiliary engine.

Two hydraulically controlled jibs can be operated through a total arc of 100° vertically or horizontally. The boom can be extended for any distance up to five feet providing a large drilling area, and making it possible for more blast holes to be drilled from one location than conventional equipment—which must be relocated after each blast hole is drilled. **(Worthington Corp., Harrison, New Jersey, U. S. A.)**

MORE PRODUCT DIGEST

High-Heat Lubrication

Molybdenum disulfide and a modified form of bentolite clay are the base materials of a new series of greases developed for high temperature operation. The composition can be varied for applications where petroleum compounds must be avoided.

The greases are reported to be capable of giving efficient lubrication at working pressures of 100,000 pounds per square inch, and can be used in machines operating continuously at 450°F **(Rocol Ltd., Swillington, Yorkshire, England)**

Facsimile Transceiver

The Hellfax KF 108 facsimile transceiver copies, receives, and transmits printed or handwritten records over normal telephone circuits. It can be used where the cost of a teletype would not be justified, or where skilled operating personnel is not available.

The device is a combination send-and-receive unit with a photoelectric scanning system. Ordinary writing paper may be used for the message which is transmitted at the rate of about 850 characters per minute. **(Dr. Ing. Rudolf Hell Company, Granztrasse 1-5, Kiel. — Dietrichsdorf, West Germany)**

Foundry Shakeout

A new non-ferrous foundry shakeout of compact design removes sand from castings faster and more completely than previous shakeouts. The new machine is designed to handle brass, bronze or aluminum molds up to 30 inches square. It can also be used for gray iron and steel molds.

The machine is only 13 inches high and is driven by a ½-horsepower motor with direct drive coupling. The entire shakeout and load are supported on soft coil springs which absorb all vibration and impact. Small fragile castings can be handled. **(Hewitt-Robins Inc., Stamford, Connecticut, U. S. A.)**

Rotary Pump Magnetic Seal

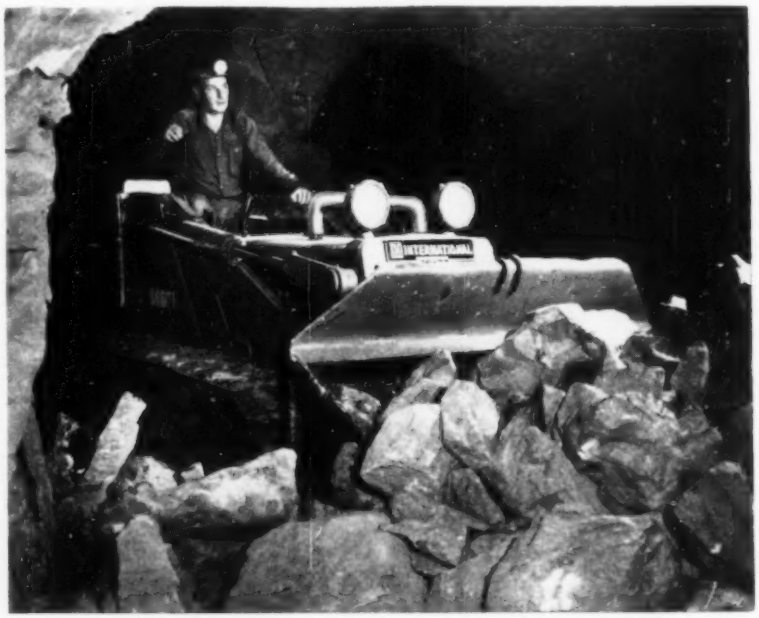
A mechanical seal for rotary pumps dispenses with stuffing boxes, and packing materials on which, previously, the life of a centrifugal pump shaft depended.

The new seals can also be used on worm and spur gear boxes, engines and any rotary shaft protruding from castings where liquid has to be retained. **(J. C. Rotary Magnetic Seal Co., Ltd., Long Road West, Batheaston, Bath, England)**

Cold Storage Room Can Be Set Up Anywhere

A new lightweight cold storage room can be erected anywhere. The unit is made of fully insulated aluminum sections, each weighing 85 pounds and is assembled simply by turning a series of patented screws into carefully designed holes and slots.

Power is provided by a hermetically sealed fractional horsepower compressor unit which uses less than one kilowatt of electricity per hour, and can be preset to maintain the required low temperature to suit whatever product is stored. There are models for zero and sub zero. When crated, the complete unit occupies only 98 cubic feet of shipping space. **(Penfold & Partners Ltd., 120-122 Victoria St., London S.W. 1, England)**



Versatile Underground Crawler Tractor

Model TD-9 crawler tractor skid-shovel was designed and equipped for non-coal underground mining operations. The new 71 horsepower diesel crawler features an exhaust gas conditioner and cooler, an exhaust gas diffuser operating with the regular blower-type fan, and a 40-gallon water reserve tank.

The complete exhaust gas conditioning system is so short-coupled that the length of the regular tractor remains the same. The system's compactness has also lowered the tractor's height to only 6 feet, permitting safe transport on rails under low trolley wires.

The underground tractor offers versatility and flexibility of attachments. It uses a standard 1½ cubic-yard bucket for tram car loading, straight and angle dozer blades, pallet fork lift for mounting of platform for drill jumbos or roof bolting, special buckets and a four-in-one 'dozer, clamshell, bucket and bullclam. **(International Harvester Export Co., 180 N. Michigan Ave., Chicago 1, Illinois, U. S. A.)**

Multi-Purpose Machine for Renovating Masonry

A multi-purpose compressed-air machine is capable of several masonry-renovation tasks. Here is what the machine does:

1. It "Colorcretes." Colorcrete is a cementitious mixture, available in a full range of colors and textures, that refurbishes old masonry walls. The machine applies both the finish Colorcrete coat and the base coat of cement plaster or stucco that is often needed on larger buildings.

2. It stuccos. This application is similar to the Colorcreting process.

3. It cleans. The machine combines a cleaning solution with pneumatic pressure.

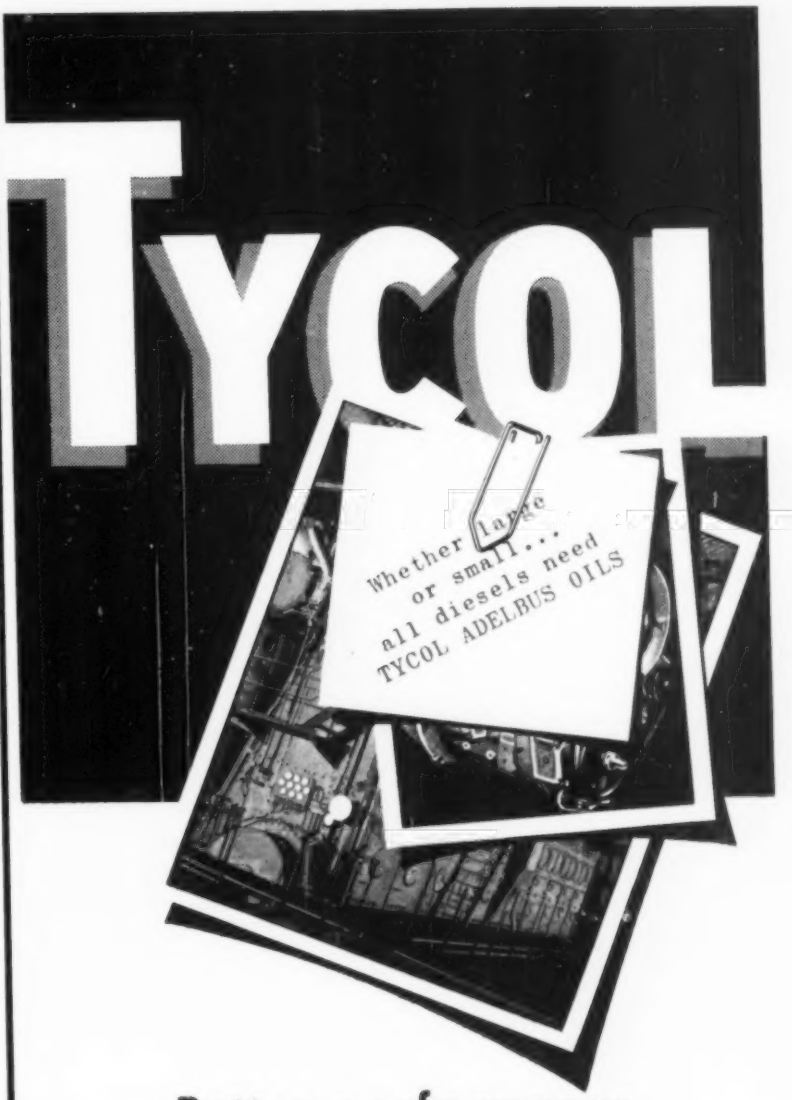
4. It sand-blasts. Sand is handled in the same way as other materials, and is combined with compressed air.

5. It doubles as an air chisel operator. An air chisel is attached to the machine's compressed-air hose. **(Colorcrete Industries, Inc., 323 Ottawa Ave., Holland, Michigan, U.S.A.)**

All-Climate Roofing

A new corrugated roofing material is said to be equally adaptable to tropical, arctic, equatorial or temperate climates. The material, known as "Cellactite," is made from a special formula which includes both asbestos and bitumen.

"Cellactite" is fireproof and capable of withstanding any extreme of temperature. It is supplied in various colors and in standard building sizes. **(Cellactite & British Uralite Co., Ltd., Gravesend, Kent, England)**

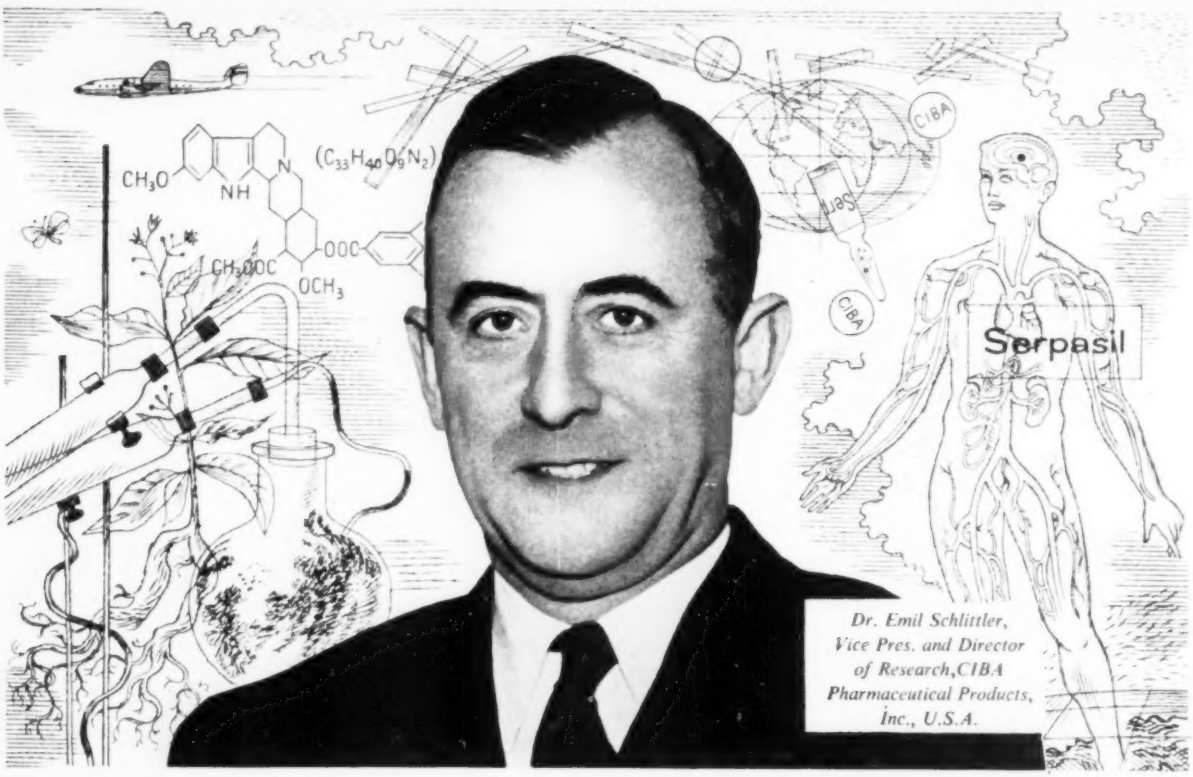


Better performance

Use TYCOL ADELBUS oils for better performance of industrial, railroad and marine diesels. These oils resist heat, provide excellent resistance to oxidation, lengthen periods between oil changes. Consult your local Tidewater distributor. He will help you solve your lubrication problems.

TYCOL VEEDOL
INDUSTRIAL LUBRICANTS
MOTOR OIL
TIDEWATER OIL COMPANY
SAN FRANCISCO • HOUSTON • TULSA • NEW YORK

PEOPLE OF SOUND JUDGEMENT



Dr. Emil Schlittler, Vice Pres. and Director of Research, CIBA Pharmaceutical Products, Inc., U.S.A.

He helped ease the stresses of life

Ten years ago something in the roots of Rauwolfia serpentina, an Indian shrub, challenged young, Swissborn Dr. Emil Schlittler. For centuries sorcerers in the Indian backwoods had treated the sick with a potion obtained from this shrub. Dr. Schlittler was determined to isolate and identify this mysterious and elusive something in the root. As an admirer of the brilliant scholars of the pre-Columbus era, which he pointedly names "the Awakening of the Modern Mind", Dr. Schlittler looked at the old problems through new eyes. He applied brand-new methods of analysis and, in sixty months, he led a dedicated team of chemists to victory - isolation of the alkaloid reserpine marketed by CIBA under the trade name Serpasil. It relaxes the anxious and tense, calms the disturbed and irritable. It is one of science's best weapons to date against the curse of modern civilization - high blood pressure. From birth to old age Serpasil can add life to years, not just years to life. Dr. Schlittler credits the CIBA-Basle team for the discovery; others may choose to credit history whose precepts inspired this chemist. Not that research and history monopolize his attention. He likes grand opera. He collects phonograph records. He modestly terms himself a junior connoisseur of wines. His colour slides mark him as a seasoned traveller. And it is not surprising that he does a lot of travelling, for such a man is in great demand. He likes to fly KLM. To Dr. Schlittler's way of thinking, KLM has soundly analyzed the needs of the passenger and found the formula for his comfort.

KLM
ROYAL DUTCH AIRLINES

All over the world people of sound judgement fly KLM

● YOUR MANAGEMENT READING

Management Digest's editorial staff here again does the "worthwhile reading" for you to save your time. For the following literature, please write on your company letterhead directly to the address given, mentioning Management Digest.

More "R & D"—Two new booklets may help your research program. "Organizing The Research Function For Profit" treats such topics as organization of technical activities and developing profitable product lines. Price: $1.75. . . . "Strengthening The Research Effort" presents material on handling research personnel, meeting the shortage of scientists, operations research, and systems engineering. Price: $1.75. (American Management Association, 1515 Broadway, New York 36, New York.)

All about Radioactivity—"Die Technischen Anwendungen der Radioaktivitaet"—written in easily understandable German—is truly an "international" book on the industrial applications of radioactivity. More than 1,500 references are discussed. (VEB Verlag Technik, Berlin 8, Germany.)

Bulletins from Industry—The M-H-F "Work Bull" line of industrial tractors—with integrated front and rear attachments—is presented in a 28-page catalog. (Massey-Harris- Ferguson Ltd., Export Industrial Sales, Toronto 3, Canada). . . . How to use low-cost optical instruments to speed manufacturing and inspection operations are outlined in "Industrial Optical Aids." (Bausch & Lomb Optical Company, 635 St. Paul Street, Rochester, New York). . . . Bulletin IDE-CIB (available in English and Spanish)—tells how Scotch Brand anti-corrosion products make easy work of difficult pipe, conduit, and cable-coating jobs. (International Division, Minnesota Mining & Manufacturing Company, 900 Farquier Avenue, St. Paul 6, Minnesota). . . . Catalog describes Van Norman's new line of ram type milling machines. (Van Norman Machine Company, Springfield 7, Massachusetts.)

Taxes, Trade, Investment—"The Belgian System of Taxation in its Relation to Corporations" is a discussion of the corporate tax structure in Belgium. Tax information on other European countries, as well as the U.S., are included. (Belgian Industrial Information Service, 630 Fifth Avenue, New York 20, New York). . . . "Puerto Rico Facts for the Manufacturer" describes the Commonwealth's industrialization program and tax advantages. (Publication Office, Commonwealth of Puerto Rico, Economic Development Administration, 579 Fifth Avenue, New York 17, New York) . . . "An American Looks at Australian Investment" will brief you on Australian tax laws and treaties, the banking structure, and investment opportunities. (Management Digest, McGraw-Hill International Corp., 330 W. 42nd Street, New York 36, New York.)

The Tropics—"Climate And Economic Development in the Tropics" deals with the effects of hot climates on men, materials, animals, plants, soils and industrial production—and suggests ways to speed development. Price: $3.50. (Council On Foreign Relations, 58 East 68th Street, New York 21, New York.)

Housing Handbook—The Inter-American Housing Center has prepared a manual to serve as a detailed, overall guide to building workers. "Cartilla de la Vivienda"—published in Spanish—simplifies such basic concepts as planning of room sizes, ground formation and water levels, preparation of materials, and housing economics. Price: $3.00. (Inter-American Housing Center, Bogota, Colombia.)

Publications Digested

American Automobile
American Letter
American Machinist
Aviation Week
Business Education World
Business Week
Chemical Engineering
Chemical Week
Coal Age
Construction Methods & Equipment
Control Engineering
El Automovil Americano
Electrical Construction & Maintenance
Electrical Merchandising
Electrical West
Electrical Wholesaling
Electrical World
Electronics
Engineering & Mining Journal
E&MJ Metal & Mineral Markets
Engineering News-Record
Factory Management & Maintenance
Fleet Owner
Food Engineering
Industrial Distribution
Ingenieria Internacional Construccion
Ingenieria Internacional Industria
Metalworking Production (London)
National Petroleum News
Nucleonics
Petroleum Processing
Petroleum Week
Power
Product Engineering
Textile World
Today's Secretary

McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y.

American Builder, Marine Engineering, Railway Age, Railway Track and Structures, Railway Locomotive and Cars, Railway Signaling & Communications
Simmons-Boardman Publishing Corp., 30 Church St., New York 17, N. Y.

American Business
Dartnell Publications, Inc., 4660 Ravenswood Ave., Chicago 40, Ill.

Architectural Record
F. W. Dodge Corp., 191 W. 40th St., New York 18, N. Y.

Banking
American Bankers Association, 12 E. 36th St., New York 16, N. Y.

Business
Business Publications Ltd., Mercury House, 109-119 Waterloo Road, London

Ceramic Industry
Industrial Publications, Inc., 5 South Wabash Ave., Chicago 3, Ill.

The Controller
Controllers Institute of America, Inc., Two Park Ave., New York 16, N. Y.

The Economist
The Economist Newspaper, Ltd., 22 Ryder St., London

Harvard Business Review
Harvard University, Soldiers Field, Boston 63, Mass.

Heating, Piping & Air Conditioning
Keeney Publishing Co., 6 N. Michigan Ave., Chicago 2, Ill.

Industrial Marketing
Advertising Publications, Inc., 200 E. Illinois St., Chicago 11, Ill.

The Management Review, Personnel, Supervisory Management
American Management Association, 1515 Broadway, New York 36, N. Y.

Metal Progress
American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio

Modern Packaging, Modern Plastics
Breskin Publications, 575 Madison Ave., New York 22, N. Y.

The Oil and Gas Journal
Petroleum Publishing Co., 211 S. Cheyenne Ave., Tulsa 1, Okla.

The Paper Industry
Fritz Publications, Inc., 431 S. Dearborn St., Chicago 5, Ill.

Petroleum Press Service
Petroleum Press Service, 91 & 93 Bishopsgate, London

Plastics, The British Motor Ship
Temple Press, Ltd., Bowling Green Lane, London

Printers' Ink
Printers' Ink Publishing Co., Inc., 205 E. 42nd St., New York 17, N. Y.

The Rubber and Plastics Age
Rubber and Technical Press, Ltd., Gaywood House, Great Peter St., London

Sales Management
Bill Brothers Publishing Corp., 386 Fourth Ave., New York 16, N. Y.

The Times Review of Industry
The Times Publishing Co., Ltd., Printing House Square, London

Welding Engineer
Welding Engineer Publications, Inc., 12 East Grand Ave., Chicago 11, Ill.

ADVERTISERS

IN THIS ISSUE

ALLIS-CHALMERS MANUFACTURING CO., INDUSTRIES GROUP 10
Agency—Compton Adv., Inc.

AMERICAN BLOWER CORP. 37
Agency—Brooke, Smith, French & Dorrance, Inc.

BETHLEHEM STEEL EXPORT CORP. 17
Agency—Gotham-Vladimir Adv. Inc.

BULLDOG ELECTRIC PRODUCTS COMPANY 5
Agency—MacManus, John & Adams, Inc.

BURROUGHS CORPORATION 34
Agency—J. Walter Thompson Co.

CIMEX-FRASER TUSON LTD. 20
Agency—City & General Adv. Ltd.

DuALL COMPANY ..... 4th cover
Agency—Russell T. Gray, Inc.

DOWNES ASSOCIATES INC. 46

HEWITT-ROBINS INTL. DIV. 38, 39
Agency—Fuller & Smith & Ross Inc.

HITACHI LTD. 18
Agency—Dentsu Adv. Ltd.

KLM ROYAL DUTCH AIRLINES 30
Agency—Stuff's Reclame-Advies en Servicebureau N. V.

KULJIAN CORP. 25
Agency—Roland G. E. Ullman

MALLORY & COMPANY INC., P. R. 2
Agency—The Aitkin-Kynett Co.

MONSANTO CHEMICAL COMPANY ..... 3rd cover
Agency—Gotham-Vladimar Adv. Inc.

OLIVER MACHINERY CO. 33
Agency—Webb J. Van Dyke

PAN AMCEL COMPANY INC. 9
Agency—Ellington & Co., Inc.

REGIE NATIONALE RENAULT 46
Agency—Promos Publicite

REMINGTON RAND INT'L 30
Agency—Robert Otto & Co., Inc.

SQUARE D COMPANY 1
Agency—Reincke, Meyer & Finn, Inc.

TIDEWATER OIL COMPANY 43
Agency—Gesellschaft Fur Marktentechnik

TOLEDO SCALE CO. 21
Agency—Beeson-Reichert Inc.

TRACTOMOTIVE CORP. 22
Agency—Bert S. Gittins Adv. Inc.

UNDERWOOD CORP. 44
Agency—Quinn-Lowe, Inc.

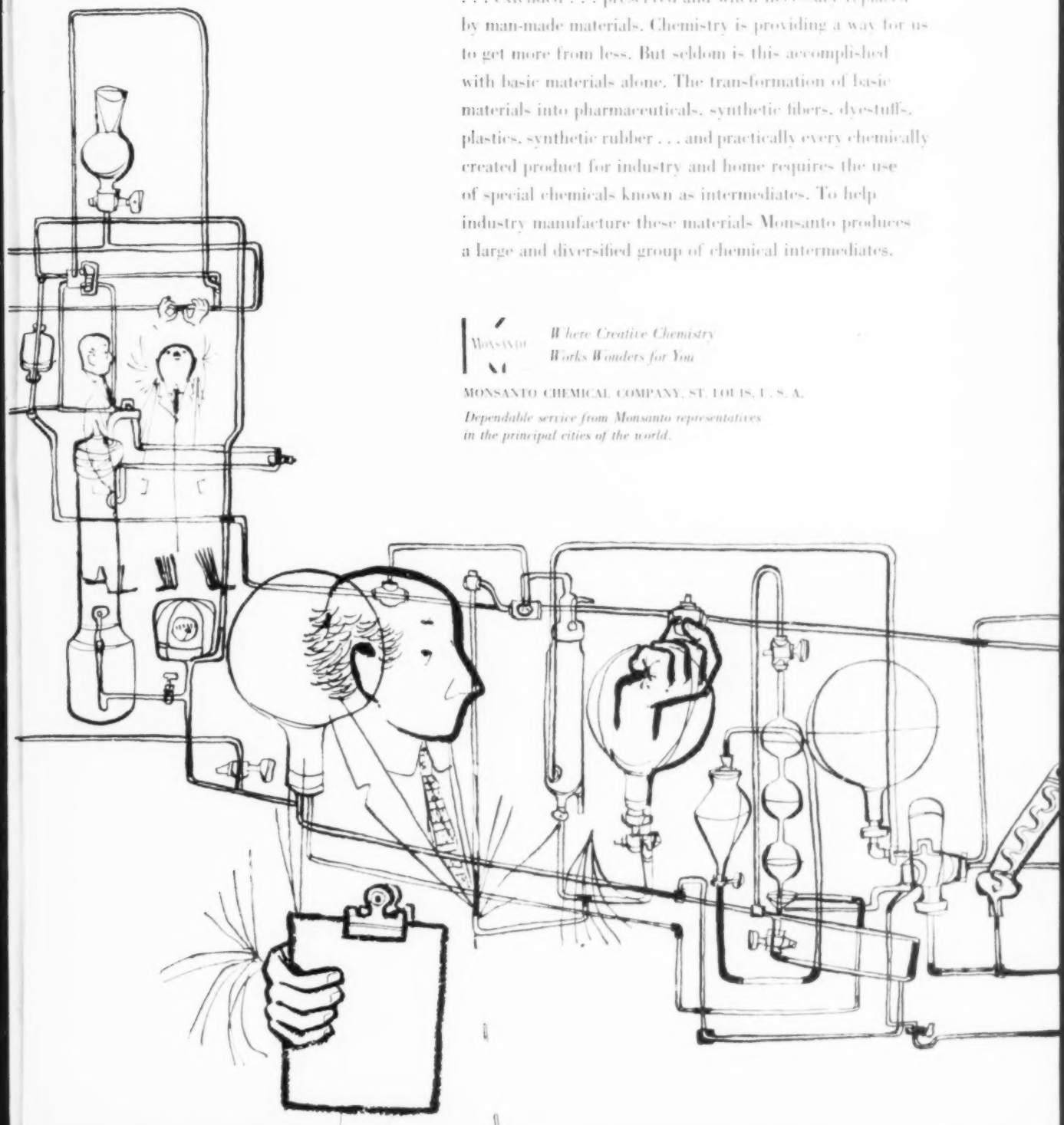
UNITED STATES STEEL EXPORT CO. 6
Agency—Batten, Barton, Durstine & Osborn, Inc.

YODER COMPANY ..... 2nd cover
Agency—G. M. Basford Co.

CONSULTING SERVICES 46

MONSANTO BASIC SOURCE | CHEMICAL INTERMEDIATES

TODAY, many of our vital natural resources are duplicated . . . extended . . . preserved and when necessary replaced by man-made materials. Chemistry is providing a way for us to get more from less. But seldom is this accomplished with basic materials alone. The transformation of basic materials into pharmaceuticals, synthetic fibers, dyestuffs, plastics, synthetic rubber . . . and practically every chemically created product for industry and home requires the use of special chemicals known as intermediates. To help industry manufacture these materials Monsanto produces a large and diversified group of chemical intermediates.

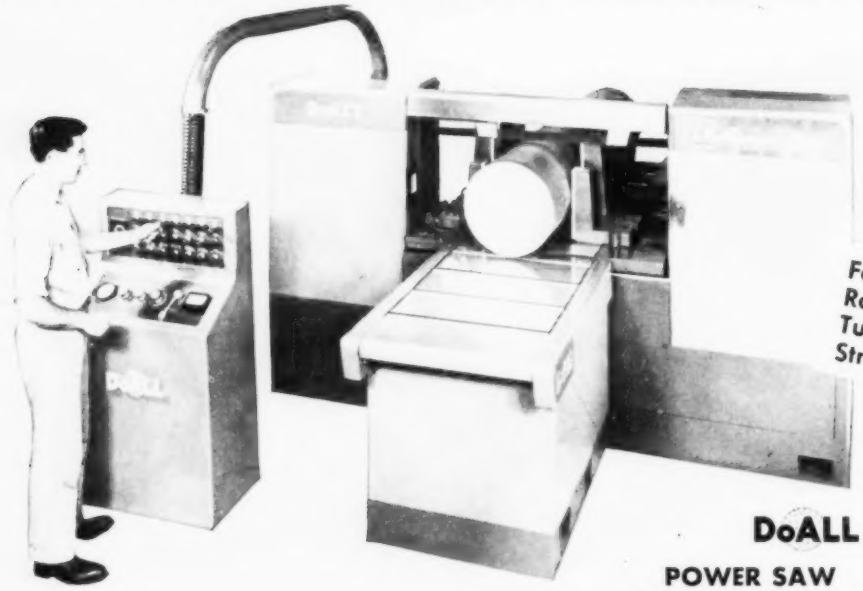


MONSANTO *Where Creative Chemistry Works Wonders for You*

MONSANTO CHEMICAL COMPANY, ST. LOUIS, U. S. A.

Dependable service from Monsanto representatives in the principal cities of the world.

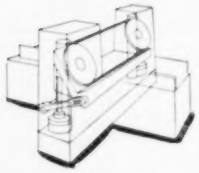
Heavy Cut-off Work
Now Done with Band Sawing Economy



Forge Blocks
Rounds · Bars
Tubing · Pipe
Structurals

DoALL

POWER SAW
24″ x 24″ Capacity
HEAVY DUTY Horizontal CUT-OFF SAW



HORIZONTAL SAWING HEAD
Unique design insures ample power and rigidity for new rugged beam 2″ wide Demon HSS Saw Band. You get heavy cuts at high speed, long band life at low tool cost.

New Design packs power, rigidity and speed for the big cut-off jobs.

Here's a machine that was designed *from the ground up* to meet a growing need by steel mills and warehouses, shipyards and other fabricators for high speed, dead accurate cut-off of heavy work pieces.

The new DoALL Power Saw Model 24 packs power, rigidity and speed behind a new rugged, continuous cutting 2″ wide Demon HSS band. It will cut heavy bars, pipe, billets and structural shapes in a fraction of the time *at a fraction of the cost* of any cut-off machine of comparable capacity. And the narrow-kerf cut will give you a bonus of many more cuts per piece in material savings alone!

Its revolutionary horizontal design results in a combination of structural simplicity, speed and accuracy of cut with new ease of handling heavy work. Variable speed, fluid drive, complete automatic operation, automatic indexing of blanks up to 12′ long, and power positioned hydraulic vises are just a few of the revolutionary time and money saving features of this new Power Saw. Call your local DoALL Sales-Service Store for details on this outstanding investment today or write: The DoALL Company, Des Plaines, Ill., U.S.A.

FEATURES

- *Finger tip control for instant response to change in speed or direction. (Manual control also available.)*
- *Powered rollers position the heaviest work pieces*
- *Fluid drive speed control meets broad range of cutting requirements.*
- *Automatic indexing table*
- *Power positioned hydraulic vises*
- *Automatic self-drain chip removal*
- *Positive feed coolant system*

For Lowest Cost . . . do it on the DoALL!

DoALL

PS-5E

BAND MACHINES . . . SURFACE GRINDERS . . . SAW BANDS . . . GAGE BLOCKS . . . GRANITE PLATES